The education divide in Indonesia

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THE EDUCATION DIVIDE IN INDONESIA

Four essays on determinants of unequal access to and quality of education

Tatang Muttaqin

To family and friends

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Four essays on determinants of unequal access to and quality of education

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Introduction

1.1 Introduction

On 11 June 2014, a story was published on the official Semarang State University (Unnes) website[1] reporting of a moment of inspiration concerning a young Indonesian woman, in a black gown and cap, who rode to her graduation ceremony in a rickshaw pushed by her father. Raeni (21 years), the daughter of Mugiono (55 years), a rickshaw driver, became the most popular university graduate of about 5 million university students in Indonesia that year. Raeni grew up in a poor family in Kendal, Central Java, and after graduating from vocational school; she was accepted in Semarang State University (Unnes) and received a scholarship from the Ministry of Education and Culture (MoEC) as recognition of her scholastic achievements. She finished her degree in accounting education with an almost perfect grade point average of 3.96 out of 4.0.

This story spread massively in both print and electronic mass media and caught the attention of President Susilo Bambang Yudhoyono, who invited Raeni and her father to meet him and his wife at the State Palace in Jakarta, where they presented her with a presidential scholarship for continuing her study in the United Kingdom. Why is Raeni's story so inspiring and why did it spread across country? Because her story represents an exception in an educational system in which the poor, no matter how academically talented, have little or no chance of advancing to university. Often, the poor do not continue to public high school, which is highly competitive, and some of them have already dropped out in elementary school or never set a foot in a school.

Raeni's story shows the importance of equal opportunities concerning access to and quality of education in Indonesia. Access to education impacts an individual's life because it has the potential to improve the ability to think critically, to solve problems and to make appropriate decisions (UNICEF, 2015). But for education to have these effects, it needs to be of good quality. Therefore, governments often seek to simultaneously improve access to and quality of education for all citizens. The Indonesian government is no exception. Although its efforts had noticeable impact, many of the targets to improve access to and quality of education nevertheless still have not been reached (Lundine, Hadikusumah, Sudrajat, 2013).

The remainder of this introduction will give a short overview of these efforts and sometimes contradictory scientific evidence about their effectiveness. This leads to the formulation of the research questions of the four studies in this dissertation, followed by a sketch of the overarching analytical framework that guides the empirical research in the studies in this book.

[1] https://unnes.ac.id/berita/diapresiasi-publik-raeni-peroleh-tawaran-beasiswa-s2-ke-inggris/

1.2 Government efforts to improve access to and quality of education in Indonesia

The formal school system in Indonesia comprises of primary to higher educational levels. The combination of 6 years primary school (grades 1-6) and 3 years junior secondary school (grades 7-9) results in 9 years compulsory basic education. After completing basic education, students continue to 3 years senior secondary school (grades 10-12) and higher education. However, before enrolling in primary school, some children attend formal or nonformal preschools. Formal preschools, such as kindergartens (*Taman Kanak-Kanak/Raudhatul Atfhal*), concentrate on learning and have structured ways of teaching, whereas non-formal preschools, such as play groups (*Kelompok Bermain*), emphasize learning through playing (Yuniarti & Hakim, 2014; Hasan, Hyson, & Chang, 2013).

This section briefly discusses several governmental programs that focus on reducing disparity in access to and quality of education in Indonesia.

1.1.1 Expanding access to preschool

To improve the access of poor children to preschools, the government has implemented the early childhood education and development project (ECED). This project ran from 2006 to 2012 and covered 738,000 children from 6,000 poor communities situated in 3,000 villages (Pradhan, Brinkman, Beatty, Maika, Satriawan, de Ree & Hasan, 2013). It aimed to enhance poor children's development and their readiness for entering primary school. Three main interventions were used: (1) training for facilitators to promote community awareness regarding the importance of preschools and to learn to prepare proposals for financial subsidy; (2) subsidies to establish two preschools; (3) training two preschool teachers per center (Hasan *et al.*, 2013).

To complement the program at the village-level, the government also financed the national program for community empowerment (*Program Nasional Pemberdayaan Masyarakat,* PNPM). This program provides incentives to communities exceeding certain preschool enrollment thresholds. This government effort contributed to increase preschool participation of children in the age of 4 and 5 years from 30 percent in 2005 (CBS, 2005) to 51 percent in 2012 (World Bank, 2015).

1.2.2 Universal education

The constitution of Indonesia states that every citizen shall have the fundamental right to obtain education. But it was only in 1973, when national income increased through the oil boom, that the government started to take measures in this direction (Presidential Instruction No. 10/1973 on the Primary School Construction Program, INPRES SD). A program was designed to make sure that all children in the age of 7 to 12 years have access to school, particularly in rural, transmigration, new settlement and disadvantaged urban

areas. This endeavor dramatically improved the enrolment rate of primary school and junior secondary school students from 41 percent and 17 percent in 1968 to respectively 99 percent and 47 percent in 1988 (Attachment to President's speech, 1993).

In 1984, the government launched a six-year compulsory education policy. This was followed, in 1994, by the introduction of a nine-year compulsory education system (Arina, 2011). In July 2005, the government introduced a *Free Basic Education* program (FBE) (Paqueo & Sparrow, 2005), and started providing a school assistance fund (*Bantuan Operasional Sekolah,* BOS) for children in primary and junior secondary education (MoEC, 2009). In 2013, the government began extending universal education from nine to twelve years (MoEC, 2013). However, since 2006, there has been little progress in reducing the number of children who are out of school (CBS, 2011). Furthermore, there is only a slight decrease in the percentage of children who leave school before reaching the last grade of their nine-year compulsory education.

1.2.3 Targeting the poor

The government took four measures to improve school access and educational attainment of children from low-income households. First, in order to buffer the hardship resulting from the economic crisis that began in 1997, the government implemented a social safety net (SSN) program to maintain school enrolment rates and transition rates, to reduce dropout rates and to maintain the quality of the teaching and learning process. The SSN program consists of a scholarship for the poor and a school subsidy (Sparrow, 2007; Sumarto, Suryahadi & Widyanti, 2002).

Second, the school operational assistance (BOS) program, introduced in 2005, provided subsidies for both public and private schools, helping them to maintain their quality of service despite rising prices of school supplies. This fund also helped the schools to pay teacher salaries and supplies when parents had difficulties in paying school fees.

Third, to anticipate negative effects of reducing the fuel subsidy, in 2005, the government implemented an unconditional cash transfer program (*bantuan langsung tunai*/BLT). Two years later cash transfers became conditional and were restricted to the domains of health, nutrition and education (*Tim Penyusun Pedoman Umum PKH*, 2007). For instance, poor households with children in the age of six to 15 received cash if their children enrolled in primary or junior secondary schools with an attendance rate of at least 85 percent.

Fourth, in 2014, the government introduced the Indonesia smart card (*kartu Indonesia pintar/*KIP). It covered about 24 million poor students, including students eligible for scholarships and others that cannot attend school because of financial issues. Recipients could withdraw funds from the card in the appointed bank outlets.

1.2.4 Improving scores in the national examinations

Since 1965, the Ministry of Education and Culture (MoEC) annually conducts national examinations (*ujian nasional*/UN) for primary and secondary school levels to assess and standardize students' performance (Fatchiati, 2015; Afrianto, 2008). Since 2005, national examinations are held by the Board of National Standards of Education (*Badan Standar Nasional Pendidikan,* BSNP) via the provinces and sub-district education offices at the end of each school year (about April or May).

The objectives of the national examination are: (1) mapping the competency and quality of Indonesian national education; (2) setting a basis for selection criteria for entrance to high education level; (3) a monitoring instrument to identify weak schools, so that special measures can be taken to improve their quality (MoEC decree 75/2009).

1.2.5 Decentralizing the education system

In 2001, the government also decentralized education by increasing local government autonomy and by allocating more resources to the level of districts and cities (*Budget Statistics* 2006-2012). This policy enables local governments to improve public services, particularly in the educational sector, because it is stated in the constitution that governments are obliged to allocate a minimum of 20 percent of their budgets to education. Additionally, more than 2.6 million public servants were transferred from the management of the central government (MoEC) to the municipalities and schools. More than three quarters of these public servants are teachers (World Bank, 2003).

1.3 The problem: persistent gaps in quality of and access to education in Indonesia

Even though the Indonesian government has made various efforts to reach the target of universal education, the objectives of increasing both access to and quality of education, while reducing inequalities, are far from accomplished. First, inequality still is a problem. In the age cohort from 13 to 15 years, 96 percent of students from wealthy households finish their education in 7 years. This figure drops to 80 percent for students from poor households (CBS 2016 calculated by Bappenas). Second, with regard to *access*, there are still more than half a million children in the age of 7 to 15 years who had never set foot in a school in their entire life, and more than 1,7 million children in total left school before completing their nine-year compulsory education (CBS, 2011). Third, in terms of competence, 55 percent of Indonesian students' scores below average according to the Programme for International Student Assessment (PISA), 43 percent scores average, and only 2 percent scores above average (OECD, 2012; World Bank, 2014). Fourth, as far as

quality is concerned, national exam scores of students in private schools are still lower than those of their peers in public schools (Newhouse & Beegle, 2006), and there are also large variations within and between Islamic private schools.

Identifying appropriate policies to mitigate these problems requires insight into the potential antecedents behind variations in access and quality of education (MoEC, 2015). A large body of studies has pinpointed a wide range of such antecedents, including differences in school ownership (public and private), regional differences, and differences in the socio-economic status of families (Al-Samarrai, 2013; Suharti, 2013; Suryadarma, 2010; Newhouse & Beegle, 2006). In addition, the transformation of Indonesia's political and administrative system, especially after the decentralization, also was found to play a role, although previous studies yielded contradicting results. On the one hand, decentralization improved educational outcomes, such as mean years of schooling and literacy rates (*e.g*. Simatupang, 2009; Usman, 2001). On the other hand, it increased school costs (*cf*. Kristiansen & Pratikno, 2006).

The above scholarship shows the multifaceted and complex interrelationship between educational attainment and inequality. Their interplay is not only related to individual factors, such as gender, but also to human capital (parental education and occupation), economic capital, social capital and government interventions at various levels. For example, one could wonder how household and village social capital – an understudied topic in the Indonesian context - links to preschool enrollment. At the national level an important question is how political capital and the transfer of resources and authority to the local level affect inequality in educational attainment. A better understanding of the interplay between this large range of resource inequalities at different administrative levels, in turn, is pivotal for finding effective policy solutions (Lynch & Baker, 2005).

This dissertation aims to provide answers to these yet unanswered questions by disentangling the complex and multifaceted phenomenon of inequality in access to and quality of education in Indonesia. The central research question of this dissertation therefore reads: *To what extent and how do individual, household, school, community and government level characteristics, in particular variation in resources, influence unequal access to and quality of education in Indonesia?*

1.4 Access to and quality of education: a multilevel, multi-resource framework

Educational inequality can be measured by diverse dimensions, such as access to education, student performance, and earning in later life (*see e.g*. Breen, Luijkx, Müller, & Pollak, 2009; Pfeffer, 2008; Blau & Kahn, 2005; Shavit & Blossfeld, 1993). This book focuses on inequalities in educational access and student achievement. Access is

measured by preschool and school enrollment (or dropout), and mean years of schooling. Student test scores are used as a measure for achievement.

Since the allocation of resources is one of the major tools a government has to affect educational outcomes, a resource perspective provides the point of departure for the analyses in this book. Resource or opportunity based explanations have successfully informed research in a variety of domains, including the educational sector. What is considered a "resource" differs between the approaches. In general, the *Opportunity Structure Approach* (Roberts, 2009; Merton, 1968) in sociology and the *Resource Based View* (Wernerfelt, 1984) in organization research use a very broad definition of resources. For example, the latter conceives resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm" (Draft, 1983 in Barney, 1991: 101). This definition includes a bundle of tangible and intangible assets, such as management skills, organizational processes, information and knowledge. In contrast, the *Education Production Function Approach* (Hanushek, 2007) focuses on student achievement as a function of the school's investments in activities and resources related to teaching, like time for instruction. Similarly, more specific frameworks, like *Human Capital* (Becker, 1993) or *Social Capital Theories* (*e.g.* Mladovsky, 2014; Song & Lin, 2009; Beard, 2005) focus on a narrower set of resources.

The studies reported in this book follow this lead. More specifically, it explores how educational outcomes are related to investments and endowments in five broad categories of resources. These different types of resources are distributed across multiple societal levels. In our study, six of these levels are distinguished (the individual student, his or her household, the school, the village, the municipality and the national level).

First, *human capital* refers to the characteristics of a student's parents, such as parental education and occupation. In terms of occupational status, we consider whether a parent has a high-status job (such as being a civil servant, a lawyer or a doctor), or whether one has low-status occupations (i.e. a farmer and a worker). For our analyses, we use aggregated information about human capital in the household, school, and municipality.

Second, the types of *economic capital* differ across levels of analysis. At the level of the household, key indicators are income, educational expenditure and the poverty status of parents. At the school level, the level of economic capital is inferred from variations in investments into the quality and intensity of the primary process of teaching, like the selection and training of teachers. At the level of the village, we conceive average wealth from the average household expenditure per capita adjusted by the municipal-level poverty rate. At municipal-level, we include average wealth, government education expenditure, average household education, poverty rate and fiscal capacity as indicators of economic capital.

Third, *social capital* reflects the structure of relations that facilitate individuals to share information, strengthen reciprocity and foster trust. We use social capital indicators at the level of the household and at the level of the village. Household level social capital

consists of: (1) association that facilitates the diffusion of information and may result in adopting behavior of others; (2) trust in institutions and other people in the community; and (3) reciprocity as indicated by the easiness to borrow or lend money from others for emergency needs. In order to assess variations in village level social capital, we aggregate information on household social capital.

Fourth, we refer to investments into infrastructures, like accessibility of schools and access to mass media, as the *infrastructural capital* at the level of the household, village and the municipality. The distance to travel to school can hinder school accessibility. Therefore, children have to make great efforts to get to school, particularly in rural and remote areas with poor transportation infrastructures. In addition, though the government has increased access to radio and television as a way to promote (ideological) unity and exert government influence (power) in peripheral areas, there are still remote areas that cannot be reached by mass media. To assess variations in access to mass media at the village level, we aggregate data on household access to mass media.

Finally, we analyze the decentralization induced changes in *political capital* as the shift of authority, responsibilities, financial and human resources to the municipal level. This includes the implementation of direct elections of regents and mayors, and the creation of new municipalities. Figure 1.1 gives an overview of the different types of capital and levels of analysis studied in this dissertation.

Table 1.1 Resources based view across levels and contextual factors

Capital➲ Level	**Economic**	**Human**	**Social**	**Infrastructure**	**Political**
National					Policy to decentralize education.
Municipal	Wealth; mean of household education expenditure; public education expenditure; poverty rate; fiscal capacity.	Proportion of parent from a senior/higher education background; Proportion of parents with a high-status occupation.	Type & level of development; urbanization.	Number of schools.	Newly created municipalities.
Village	Mean of wealth.		Association; trust; reciprocity; urbanization.	School availability; access to mass-media.	
School	Investments in teaching time, teacher selection, financial support to students.	Proportion of parents with a senior/higher education background; Proportion of parents with a high-status occupation. Investments in teacher training.			
Household	Expenditure per capita, education expenditure; poverty status.	Head of household education background; parental education.	Association; trust; reciprocity.	Access to mass-media.	

This multilevel multi-resource framework allows to systematically address one of the most pressing policy issues related to educational attainment: to what degree can a specific kind of resource deficiency that hampers access to and quality of education be compensated by access to resources of another type or from another level?

Three types of interplay can be distinguished. The first refers to *within-level cross-resource effects*. For example, if a lack of household economic capital may inhibit enrolling kids at school, can household social capital compensate for this lack of resources? The second refers to *between-level single-resource* effects. For example, under which conditions might school or municipality level economic capital offset a lack of economic resources at the household level? Finally, there are *between-level cross-resource effects*. For example, to what degree may a low degree of human capital at the household level be compensated by school level economic capital like investments in teacher education? The four studies in this book explore a large variety of these effects.

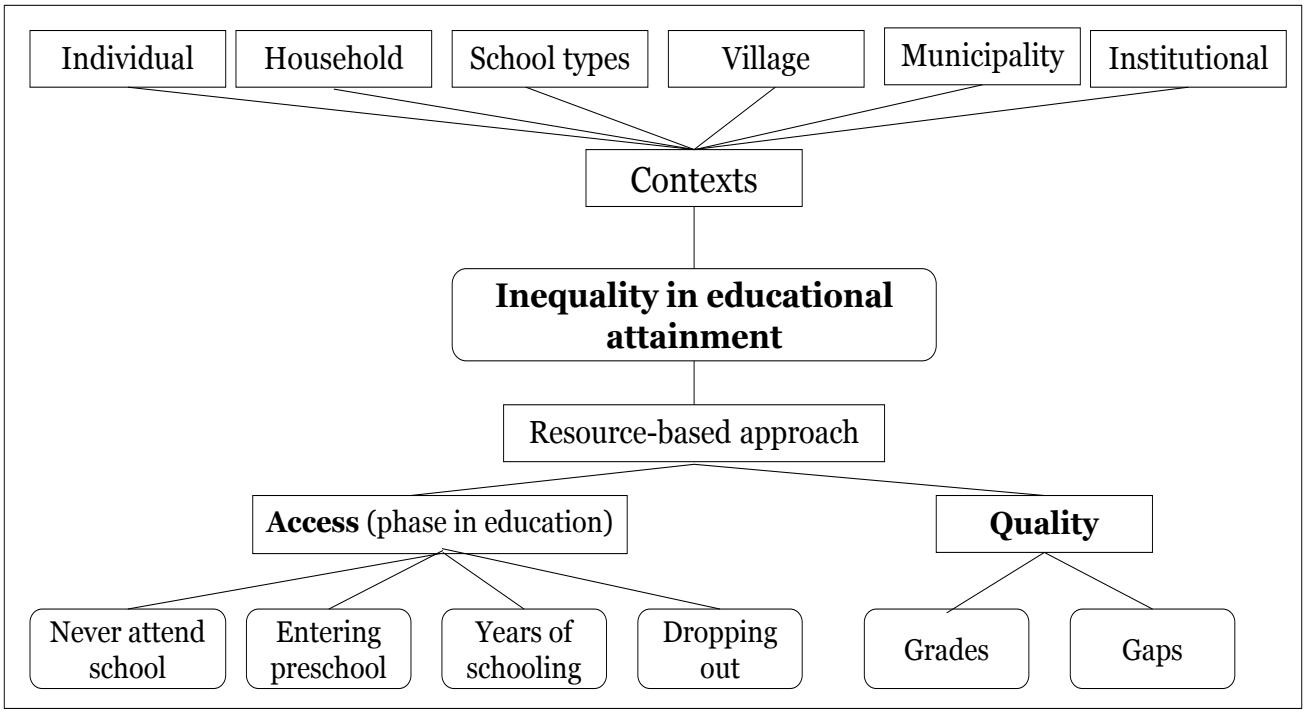
Although much progress has been made in understanding the combined effects of various resource investments in education (*e.g.* Suharti, 2013; Saraswati, 2012; Newhouse & Beegle, 2006), it is still unclear how the interplay between resource investments at household, village, school, and municipality-level jointly affect variations in educational outcomes in the context of decentralization of the Indonesian public sector.

Policy makers could opt to intervene in almost all levels in an attempt to reduce inequalities in education. Utilizing a resource-based approach, this study provides a comprehensive picture for policy makers to identify what kind of resources at which level might be needed to reduce educational inequality, and what type of stakeholders are involved and needed to contribute to government efforts to narrow this inequality.

1.5 Applying the framework: four studies

The four empirical chapters in this dissertation investigate the impact of differences in resources (at the individual, household, school, village and municipality-level) on four aspects of access to and/or quality of education: 1) Children dropping out of school or never attending school; 2) Preschool participation; 3) School participation and length of schooling; 4) Student achievement and achievement gaps. Figure 1.2 provides a conceptual model of the four studies.

Figure 1.2 Visual summary of research elements in dissertation



1.5.1. Being out of school: municipality and household level antecedents

Unlike in developed countries, lack of money for education at the household level is still a salient factor in developing countries. Many factors can stimulate or hamper school enrollment. On the one hand, governments could commit resources to provide free education for low-income children to address this issue. The Indonesian decentralized educational system depends heavily on municipalities (districts and cities as the autonomous local governments) that have the authority and resources to manage primary and secondary education services that could explain why some children are in school and others not (Colclough, Rose, & Tembon, 2000).

On the other hand, economic revival can create temporary job market opportunities that may result in students *dropping out of school* (Gangl, 2002; Allensworth, 2005). Also accessibility problems as they may result from physical disability or living in remote areas could also be obstacles that cause large groups of children to never attend school (Shindler, 2010; Arunatilake, 2006). Last but not least, household resources and characteristics will also influence children's opportunities to attend school (Rumberger & Larson, 1998; McNeal, 1999; Pong & Ju, 2000).

An underexplored question in previous studies is to what degree municipality and household resources contribute to decrease the number of children never attending or dropping-out from school. Therefore the first sub-question of this dissertation is: *Which characteristics at the level of municipalities, households and children help to explain*

why children never attend or drop out from school in Indonesia? This question is addressed in Chapter 2. Building on an opportunity structure approach (Roberts, 2009), it focuses on educational opportunities and constraints, particularly in terms of available resources at the municipal level (such as government education expenditure, poverty rate, mean of household education) and the household level (such as parental wealth and education, education expenditure and school availability near the house).

This chapter enriches previous research on children that are out of school (Shahnaz & Naeem, 2012; Suliman & El-Kogali, 2010; Shindler, 2010; Arunatilake, 2006) in three ways. First, it elucidates to what degree never attending school and dropping out of school are associated with the same antecedents (Shindler, 2010). Second, whereas previous studies have mainly focused on explanations based on characteristics of the individual, the family or the community (cf. Wenger, 2002; Rumberger, 2004; Allensworth, 2005; Anderson, 2010), this chapter also incorporates municipality factors. Third, the application of multilevel analysis allows us to examine cross level multiple resource effects on both dropping out and never attending school.

1.5.2. Preschool participation: household and community level antecedents

Indonesia has low preschool participation rates (World Bank, 2015). Studies show that parental resources are crucial for preschool enrolment (Hasan *et al.*, 2013; Self & Grabowski, 2008; Alderman, 2006; Knight & Song, 2000). In developed countries, next to parental SES, social capital was found to improve enrolment rates (Smith, Beaulieu & Seraphine, 1995; Teachman, Paasch & Carver, 1996). Indonesia has dense social networks and community organizations (Lasagni & Lollo, 2011), which can buffer the lack of economic resources (White & Kaufman, 1997) or may complement other forms of capital (Robison, Schmid, & Siles, 2002) which may cause the low preschool participation rate. For example, social capital may contribute to the effectiveness of policies aiming to enhance preschool enrolment through social and financial support. Nevertheless, little is known about the link between social capital and educational outcomes. Chapter 3 therefore addresses the second sub-question of this dissertation: *To what extent and under which conditions can variations in preschool participation be explained by differences in household-level and community-level resources, and what is the moderating role of social capital?*

By including the effects of social capital both at household and community-level, this chapter fills a gap in current scholarship on preschool participation in Indonesia, in which these aspects have so far received little attention (e.g. Hasan *et al.*, 2013; Self & Grabowski, 2008; Barnett & Yarosz, 2007; Alderman, 2006). In addition to main effects of social capital, this chapter investigates the interplays between SES and social capital within the household level.

Furthermore, moderation analysis allows disentangling the potentially complementing and compensating effects of social capital. Complementing effects of social capital suggest to strengthen the effects of other resources (Song & Lin, 2009). Compensation effects of social capital can buffer lack of other resources (Mladovsky, 2014). For instance, can social capital compensate low parental income and education? And, under which community conditions are the effects of social capital weakened or strengthened (i.e. cross-level interaction effects)?

1.5.3. Educational attainment: provincial and municipal level antecedents

With the decentralization of the educational system, local governments acquired a more central position in the allocation of political and financial resources to education services. However, there is disagreement about how decentralization may impact educational outcomes. On the one hand, decentralization enables the local government to properly respond to local demands to improve educational services (Simatupang, 2009; Heredia-Ortiz, 2007).

Proponents of educational decentralization therefore predict rising enrollment rates, mean years of schooling, adult literacy rates, female literacy rates, and decreasing dropout rates (Simatupang, 2009; Galiani & Schargrodsky, 2002; Habibi *et al.,* 2001). Conversely, opponents predict a negative impact on educational outcomes and increasing school costs (Kristiansen & Pratikno, 2006; Treisman, 2000). In an attempt to settle this issue, this study investigates under which conditions variations in local government resources relate to educational attainment. Chapter 4 therefore addresses the third sub-question of this book: *To what extent did the decentralization of Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels?*

This chapter contributes to the existing literature on education in Indonesia by presenting the first "before and after analysis" of the impact of decentralization on regional variations in educational attainment. This study also provides insight of the effect of decentralization on regional inequality which may be helpful in developing context-specific policy interventions aimed at reducing regional disparities in the Indonesian setting.

1.5.4. Student achievement: school level antecedents

Differences in resources also affect the quality of education in terms of student achievement, and they may lead to achievement gaps. Previous research emphasizes differences between public and private schools (*e.g.* Bernardo, Ganotice, & King, 2015; Braun, Jenkins, & Grigg, 2006; Newhouse & Beegle, 2006), but paid relatively little

attention to differences *between* private schools, in particular between Islamic private schools. These differ considerably in terms of ideological orientation ("stream": modernist, traditionalist, integrationist) and organizational arrangements ("track": madrasah versus non madrasah schools). We argue that these ideological and organizational profiles reflect considerable differences in resource allocation decisions, i.e. the degree to which investments are made into the primary process, like teacher selection and training. We expect these differences to affect student achievement. Chapter 5 therefore asks: *How can variations in the (gender and parental socio-economic status related gaps of) academic achievement of students attending private Islamic schools be explained by ideological and organizational differences of their schools?*

Using an education production function approach (Hanushek, 2007), this chapter argues that schools investing more into the primary process of teaching (*e.g.* through time investment, selection and training of teachers) will produce students with better outcomes on national exams. Additionally, this study examines achievement gaps by conducting interplays *between level single resource* effects and *between levels cross resource effects*.

Using interaction analyses, we expect that one resource can be complementary or compensatory (buffer) of the other resources. For instance, implementation of single sex education in the madrasah track and integrationist stream may reinforce the gender achievement gaps. In terms of the SES gap, financial support for low SES students via scholarships could improve attendance in the non-madrasah track and the Traditionalist and Modernist stream, which may reduce achievement gaps.

1.6 Research design and data

We use and combine various nation-wide surveys and administrative datasets from five different sources: (1) Central Bureau Statistics (CBS), (2) Ministry of Education and Culture (MoEC), (3) Ministry of Finance (MoF), (4) Ministry of Development for Disadvantaged Region (MDDR) and (5) Ministry of Home Affair (MoHA). In addition, we collected primary data from expert interviews with heads of Traditionalist, Modernist and Integrationist non-governmental umbrella organizations in Indonesia. In most chapters, we made combinations of various datasets in order to extract the required multilevel information necessary to answer our research questions with multilevel data analysis techniques. Below the main data sources are discussed.

1.6.1. National socio-economic survey (Susenas 1996-1999 and 2008-2011)

Several chapters make use of the rich dataset provided by the national socio-economic survey (Susenas), conducted by the Indonesian *Central Bureau of Statistics* (CBS). This

survey monitors key indicators of social and economic development in Indonesia. It started in 1963 with 16,000 households in the sample. During 1963-1978, it was conducted every two years (the Core). Since 1992 the core module is collected annually. Modules on special topics are added every three years. In 2011, the Susenas covered 285,307 households, which comprised 1,118,239 individuals (CBS, 2011). The annual Core covers eight indices: demography, health, education, labor, fertility, family planning, housing, and consumption. The Module is divided in three clusters: (1) social, culture and education; (2) housing and health; (3) household consumption and expenditure (CBS, 2013). The survey initially uses a stratified multi-stage cluster sampling with two strata (urban and rural) for each municipality.

Then, it follows a two-stage cluster sampling strategy for urban areas by dividing them into census blocks (CBs) and then to select a number of CBs using linear systematic sampling. In rural areas, a number of sub-districts are sampled using probability proportional to size of population. For each selected CB, sixteen households are selected to be interviewed by using linear systematic sampling (CBS, 2011; Hull, 2013). We used the Susenas data to examine the effects of various forms of capital on education inequality, such as human capital (parental education and occupation) and economic capital (education expenditure and poverty status of parents) at the household and municipal level, and social capital (association, trust and reciprocity) at the household and village level.

1.6.2. Village potential (Podes, 2011)

Since 1980, the CBS also compiles the so-called Village Potential (Podes) dataset as part of the population census. In 2011, *Podes* covered 75.410 villages. It contains general information about villages, such as the village population, employment, housing and environment issues, education, health, socio-cultural aspects, transportation, communication, information, land usage, economy, security, village autonomy, community empowerment programs, village apparatus, agriculture, and supporting factors and obstacles (Hull, 2013). In terms of education, it covers information on the numbers of educational institutions, ranging from preschool to university, general and religious, and public and private schools/universities. We use the *Podes* data to study the availability of schools in the village and to acquire information about school distance.

1.6.3. National examination dataset (MoEC, 2013)

National examination data is administered by the Education Assessment Centre of the Research and Development Board, which is part of the MoEC. The data covers the national exam scores of all four national exam subjects (Mathematics, Science,

Indonesian and English) at the junior secondary school level. Along with the scores, the dataset provides information about the gender and age of the students, their parental education and occupation, school names and locations. In 2013, the dataset consisted of 3,671,863 students nested in 48,962 schools, both public and private, and madrasah and non-madrasah. We used the data to investigate the effects of human capital and economic capital at household, school and municipal level on student achievement and achievement gaps in various tracks and streams in private Islamic schools.

1.6.4. Local government expenditure/LGE (MoF, 2013)

The Ministry of Finance (MoF), via the Directorate General of Regional Budgeting (MoF, 2013), offers electronic access to the local government expenditure (LGE) dataset. It covers local government expenditure (LGE) data, classified into nine dimensions: (1) general services; (2) order and peace; (3) economy; (4) environment; (5) housing and service facilities; (6) health; (7) tourism and culture; (8) education; and (9) social protection. We used the LGE dataset to investigate the effect of municipality education expenditure on education inequality.

1.6.5. Fiscal capacity index (MoF, 2011)

The requirement to report information of the local government's fiscal capacity originates from a decree of the Minister of Finance (MoF) No.244/PMK.07/2011. We used this fiscal capacity index to investigate the effect of municipality fiscal capacity on municipality educational attainment.

1.6.6. Municipality development (MDDR, 2011)

The municipality development dataset refers to data on 183 underdeveloped municipalities. The MDDR was issued by the Ministry for the Development of Disadvantaged Regions (MDDR) in 2011. It defines underdeveloped municipalities on the basis of six criteria: economy, human development index, infrastructure, fiscal capacity, accessibility and other local characteristics. We merged the municipality development data of the MDDR with the Susenas dataset, and classified the municipalities in three types: city, developed district and underdeveloped district.

1.6.7. Newly created municipalities (MoHA, 2008-2011)

Information of newly created municipalities was retrieved from the Ministry of Home Affairs (MoHA). Based on an updated list of the number of municipalities for 2008-2011, newly created municipalities could be identified. We used this data to examine whether there are differences between 'old' and 'new' municipalities and whether this affects municipality educational attainment.

1.6.8. Expert interviews with heads of Traditionalist, Modernist and Integrationist organizations

For the chapter on differences in resource investments in different tracks and streams in private Islamic schools, we interviewed the Vice Chairman of the Primary and Secondary Education Council of Muhammadiyah (*Modernist)*, the Vice Chairman of *Lembaga Pendidikan Maarif Nahdatul Ulama*/NU (*Traditionalist*, and the Chairman of *Jaringan Sekolah Islam Terpadu/*JSIT (*Integrationist*). These experts provided crucial background information about the streams' vision and mission and how the schools incorporate the national curriculum. In addition, the experts informed the researcher on the number of teaching hours, teacher training, teaching qualification, extra attention for specific subjects, investments in coordination, financial or other support for low SES pupils, and implementation of single sex classes. We also consulted these experts to crosscheck the schools' membership to one of the three streams and one of the two tracks.

Table 1.2 provides a summary overview of the empirical chapters, research design and data.

Table 1.2 Summary of the empirical chapters of the dissertation

Chapter	Research question	Dependent variable	Data source and design
2	Which characteristics at the level of municipalities, households and children help to explain why children never attend or drop out from school in Indonesia?	School enrolment: (1) never attended school; (2) attending school; (3) drop-out.	▪ National socio-economic survey (Susenas, 2010). ▪ Village Potential (Podes, 2011). ▪ Local government expenditure/LGE (MoF, 2013). Multilevel multinomial regression analysis
3	To what extent and under which conditions can variations in preschool participation be explained by differences in household- and community-level factors - such as SES, modernization and urbanization – and what is the moderating role of social capital?	Preschool enrollment.	▪ Susenas, 2009. ▪ Village Potential (Podes, 2011). Multilevel logistic regression analyses.
4	To what extent did the decentralization of Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels?	Length of schooling.	▪ Susenas 1996-1999 and 2008-2011). ▪ Municipality development (MDDR, 2011). ▪ Newly created municipalities (MoHA 2008-2011). ▪ Fiscal capacity index (MoF, 2011). Multilevel regression analyses
5	How do various streams and tracks in Islamic private schools affect students' academic achievement and reducing achievement gaps across gender and parental SES?	National examination (NE) scores of Mathematics, Science, and English.	▪ National examination dataset (MoEC, 2013). ▪ Susenas, 2010. Multilevel regression analyses.

1.7 Contributions

This book contributes to the sociology of education in at least three ways. First, this dissertation is among the first to use a multilevel multi-resource framework to generate systematic quantitative evidence on the determinants of unequal access to and quality of education in Indonesia. This allows a more fine grained exploration of the complex interplay between different levels and different types of resources, and their effect on inequality in access to and quality of education. The propositions and findings concerning *within-level cross-resource effects*, *between-level single-resource effects* and *between-levels cross-resource effects* may also be useful in guiding future research on educational inequality in other countries.

Second, in terms of institutional change, this study is among the very few that tries to trace how Indonesia's "big bang" decentralization affects educational outcomes through time.

Finally, this study draws on an exceptionally large body of different large scale datasets from different sources. The combination of several of these datasets allowed us to achieve an exceptionally high degree of contextualization both with regard to a large number of levels of analysis and policy making (the individual, household, school, community, municipality and province), as with regard to a broad range of resources and capitals (economic, human, social, infrastructure, and political capital). This encompassing multilevel multi-resource framework provides researchers and policy makers with a more complete picture of the determinants of access to and quality of education in Indonesia. The findings of the studies, therefore, may assist policy makers to carefully think through policy and budget allocation decisions while attempting to further improve access to and the quality of education in Indonesia.

2

Why do children stay out of school in Indonesia? The impact of municipal variations and household characteristics[2]

Abstract

This paper uses an opportunity structure approach to theorize and empirically study why some children are not going to school in Indonesia. We study a set of municipality and household characteristics that could either hinder or facilitate children to be out of school by means of a dataset consisting of 221,392 children, nested in 136,182 households in 497 municipalities. We study two groups of children – those who have never started school and those who have dropped out from school – and compare them to the large majority of children who are going to school, using multilevel multinomial regression analysis. Results show that municipality and household resources both facilitate and constrain children from going to school and those children who never attend school differ from children who drop out in a limited set of predictors. At the municipality level, findings show that the higher the poverty rate and public education expenditure per capita, the higher the likelihood that children drop out. In contrast, a high(er) mean of municipality education expenditure significantly reduces children's likelihood to never attend school while a high(er) poverty rate significantly increases the likelihood of children to never attend school. At the household level, the findings show that household expenditure, household education expenditure, and head of household's educational background have a significant effect on reducing the likelihood that children are out of school. Belonging to a female-headed household increases the likelihood that children never attend or drop out from school. Finally, results show that living in a village with a school nearby decreases the likelihood of children never attending school, but this has no effect on children dropping out from school.

[2] This chapter is co-authored with Rafael Wittek, Liesbet Heyse and Marijtje van Duijn and is currently under review at an international peer-review journal.

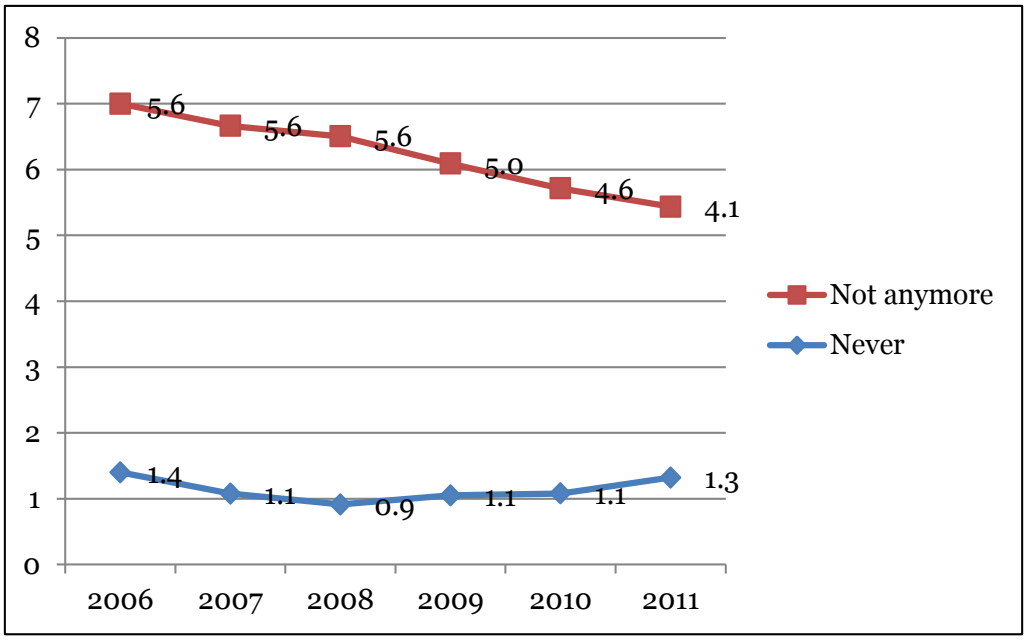
2.1 Introduction

United Nations General Assembly resolution 44/25/1989 on the Convention on the Rights of the Child emphasizes the pivotal role education plays in human development. Even though many countries have ratified this convention, globally, there is still a large gap between its ratification and implementation. Approximately 69 million children, mostly girls, are still deprived of their right to basic education (UNICEF, 2014). In line with the global agenda, all citizens have the essential right to access to education as declared by the Constitution of Indonesia. Eager to improve access and quality of education, the People's Consultative Assembly in Indonesia amended the Constitution in 2001 by allocating 20 percent of the state budget to education (Blöndal, Hawkesworth & Choi, 2009).

As is happening in many other developing countries, the Indonesian Government has made a push toward universal primary and junior secondary education by introducing a Free Basic Education policy (FBE) in July 2005 (Paqueo & Sparrow, 2005) to release the poor from education costs. This policy supports a nine-year compulsory education program and access to education has improved nationally, especially when the government started providing a fund (*Bantuan Operasional Sekolah*/BOS) for children in primary and junior secondary education in 2005 (MoEC, 2009).

In 2013, the government began extending universal education from nine years to 12 years (MoEC, 2013). As a matter of fact, the Indonesian education system provides educational services for more than 50 million pupils from primary to senior secondary education who are enrolled in 247,383 schools. A majority of them (about 42 million children) is registered in primary and junior secondary schools as part of compulsory basic education (Central Bureau Statistics/CBS, 2014). However, since 2006, there has been little progress in reducing the number of children who are out of school. As Figure 2.1 illustrates, the percentage of children who never attend school throughout their entire lives has not really decreased. In addition, there is only a slight decrease in the percentage of children who leave school before reaching the last grade of their nine-year compulsory education.

Figure 2.1 Trends of children out of school in Indonesia (%)



Source: Calculated from Susenas 2006-2011, CBS

Although only 5.4 percent of children are out of school, this represents a large group. For instance, in 2011, 1.77 million children left school without a diploma, and 568,086 children had never set foot in a school in their entire life. This dismal condition continues despite the Indonesian Government signing various international conventions on education that bind the state to guarantee the fundamental right to education to citizens, including the *Education For All* (EFA) agreement in 1990, the Millennium Development Goals' Joint Declaration on Education in 2000, and the Dakar Framework for Action in 2000.

This paper aims to simultaneously explain why some Indonesian children never go to school and others drop out. The concept of 'out-of-school children' generally refers to children that should be in primary school but are not (UNESCO, 2005). For this study on Indonesia, we broaden the concept to compulsory basic education, focusing on children aged 7-15 years who should be in primary and junior secondary schools.

Theoretically, we depart from an opportunity structure approach, which refers to the scale and distribution of conditions to accomplish specific outcomes (Merton, 1995, p.25) and specifically to the rules and norms that individuals are supposed to comply with in order to achieve socially desired goals. For instance, education is one legitimate opportunity structure to increase one's chances for a good job and higher income. However, not everyone will be able to follow this legitimate opportunity structure. Instead, people may use different opportunity structures to reach the same goal (e.g. good job, higher income). For the purpose of this paper, we focus on the educational

opportunities and constraints that children face at the municipality and household level, and especially in terms of the resources available to go to school.

Because of Indonesia's decentralized system, the effectiveness of national policies depends heavily on municipalities (districts and cities) since these autonomous local governments have the authority and resources to manage primary and secondary education services. We therefore expect that municipality resources – such as public education expenditure per capita, poverty rate and average household education expenditure per municipality – will explain why some children are in school and others not (Colclough *et al.*, 2000). Although local governments might provide an adequate budget to abolish the educational fee, making it free, several children still might be out of school because their household resources are limited. Thus, we reason that household resources and characteristics will also influence children's opportunities to attend school (Rumberger & Larson, 1998; McNeal, 1999; Pong & Ju, 2000). Hence, the main research question of this paper reads: *Which characteristics at the level of municipalities, households and children help to explain why children never attend or drop out from school in Indonesia?*

This study makes three contributions to current research on educational attainment. First, though much research focuses on school dropout, only few studies pay attention to children who never set foot in a school in their entire life (Shahnaz & Naeem, 2012; Suliman & El-Kogali, 2010; Shindler, 2010; Arunatilake, 2006). Second, by empirically assessing the opportunities and constraints that these children face and by relating them to those of children who do attend school or have dropped out from school, we can provide a systematic comparison of these three groups in one study. This allows us to shed light on similarities and differences between children who never attend school and those who dropped out from school (Shindler, 2010). Third, whereas previous studies have mainly focused on individual, family and community-related explanations (cf. Wenger, 2002; Rumberger, 2004; Allensworth, 2005; Anderson, 2010), we extend the focus by incorporating municipality factors and employ multilevel analysis that allows us to simultaneously examine the effects of children, household and municipal levels. Thus, this study provides insights into the effect of government resources at the municipality level on school attendance. Policy makers in Indonesia's education sector may benefit from this analysis, since it disentangles to what degree and how government investments in education generate the desired effects.

Below, we develop a set of hypotheses on the effects of municipality and household characteristics. Multilevel multinomial regression analysis is applied to a data set of 221,393 children aged 7-15 years, nested in 136,183 households in 497 municipalities. We utilize datasets from 2010, i.e. one decade after the implementation of the decentralization that empowered Indonesian municipalities to manage themselves as autonomous entities, in the education sector as well.

2.2 Theoretical framework

We base our study on opportunity structure theory, which refers to the idea that opportunity, i.e. the chance to gain certain goals, such as occupation and education, is shaped by the way society or an institution is organized or structured (Roberts, 2009; Merton, 1968). This theory suggests that people live in the social order that consists of culture and structure. While culture creates goals for persons in society, social structure may facilitate individuals to achieve those aims. A well-established society provides legitimate and appropriate ways to achieve one's goals (Merton, 1968).

Nevertheless, if there is a discrepancy between cultural goals and these structurally accessible means, individuals seek and use other means to achieve their objectives. In the case of children's education, this means that when a society (culture) holds the shared value that education is important, but the structure does not provide equal access to legitimate means for achieving the aspiration, higher levels of deviance will result. People will be more likely to create innovative alternatives for achieving the same goals everyone aspires to. For instance, the objective of education is to increase social mobility and when people are unable to attend school, they may go to work earlier.

Roberts (2009) classifies two dimensions in the opportunity structure. The push force is exerted mainly by ascribed status, such as family background and gender, and the pull factor comes from the government, as a service provider of education. In this paper, we focus on educational opportunities and constraints, particularly in terms of available resources at the macro (government) and micro (household) level.

At the municipal level, local government is a structure that may provide educational opportunities and constraints. For instance, when local governments have adequate budgets they can provide affordable and free education nearby, which also increases accessibility to schools. At the household level, we assume that mainly parents or other caretakers make the investment decision to send children to school, as in most other countries. We expect parents or caretakers to weigh future benefits of sending their children to school as an opportunity against the constraint of immediate costs. Children, but also other household members, may benefit from these investments. For example, in the absence of pension systems, children are often expected to look after their parents when they are old (Huisman & Smits, 2009). Therefore, education might be a way to increase future household income, and thus provide a better 'pension' for parents. Hence, factors at both local government level (i.e. the municipality) and household level influence educational opportunities and constraints, which in turn may influence the likelihood that children are out of school.

A similar distinction can be identified in the empirical literature on out-of-school children in developing countries, including Indonesia. This literature focuses on examining determinants of school dropout. First, explanations focus on *individual factors* associated with dropping out. Studies along this line show that grade repetition (Stearns, Moller, Blau, & Potochnick, 2007), bad health (Lleras-Muney, 2005; Albouy &

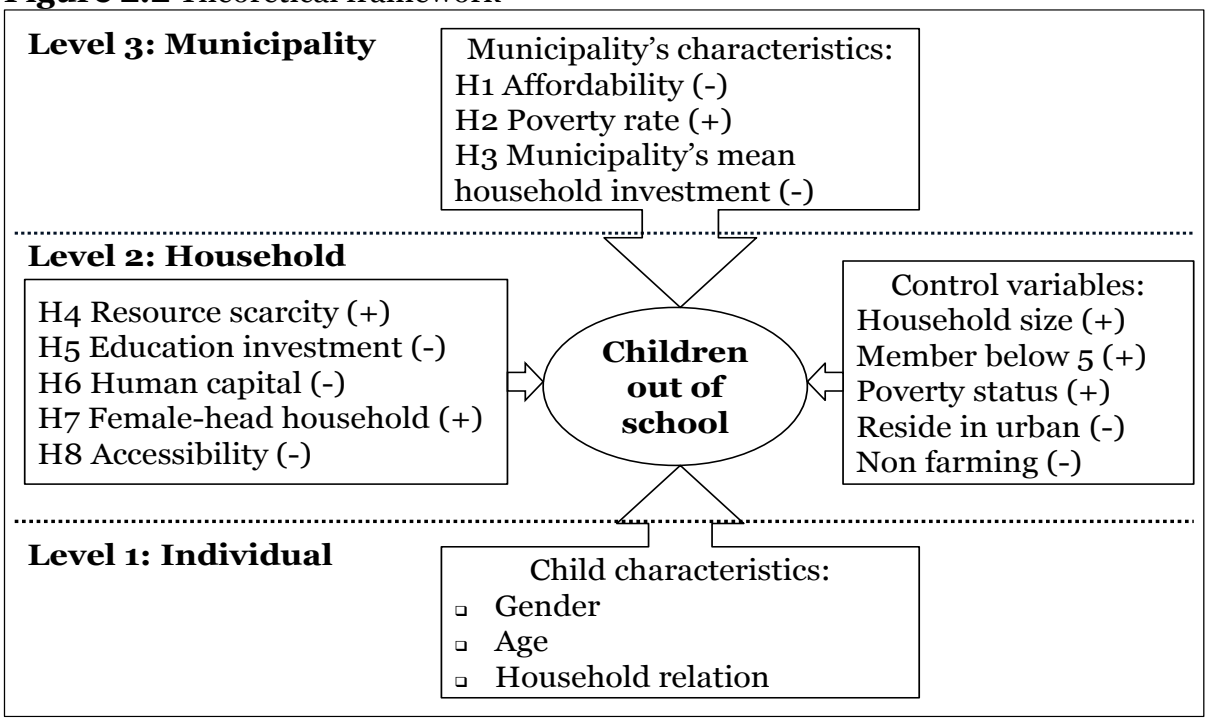
Lequien, 2009; Powdthavee, 2010), truancy behavior (Attwood & Croll, 2006; Henry, 2007; Jencks & Mayer, 1990; Wenger, 2002; Anderson, 2010), low commitment to the school, and low motivation increase the likelihood for dropping out. Second, explanations from the *institutional perspective* emphasize the role of a student's social context, particularly families, schools, communities and peers. Here, studies show that dropout increases for students from disadvantageous backgrounds (Levin, 1987; Rumberger, 2004), and the school's structure as measured by type, size and social climate (Rumberger, 1995). Other studies show that economic revival could create temporary job market opportunities so that students drop out of school (Gangl, 2002; Allensworth, 2005).

Only a few studies address children who never go to school. Using the individual and institutional categorization, some studies emphasize individual factors to explain why children never attend school. For example, Suliman and El-Kogali (2010) revealed that the opportunity costs of a child's time and a child's lack of interest in school influence children's non-participation in Egypt. Additionally, Shindler (2010) concludes that physical disability seems a substantial barrier to accessing education, especially in rural areas in South Africa.

The institutional factors associated with children never attending school vary. For instance, Arunatilake (2006) explored the determinants of non-participation of 5–14 year old children in Sri Lanka and found that various demand and supply-side factors influence the decision of parents to keep children out of school, such as poverty, direct and indirect costs of schooling, cultural factors and job market relevance. In addition, Suliman and El-Kogali (2010) found that teacher shortage, school proximity, lower awareness of parents about benefits of child education, mother's autonomy, parents' education, household ownership of farm/land, and the percentage of fathers in white-collar jobs in the community, customs and traditions are significant predictors of children out of school in Egypt.

Building upon the notion of push and pull factors, as well as micro and macro-level explanations, below we first discuss how local government resources provide opportunities for children to go to school and then continue by analyzing educational constraints and opportunities at the household level. Figure 2.2 provides a summary overview of our conceptual model. To simplify the hypotheses, we assume that the social mechanism leading to children never attending school or dropping out from school is quite similar. The analysis will see to what extent this assumption holds. Any differences detected will be discussed in the conclusion.

Figure 2.2 Theoretical framework



2.2.1 The impact of local (government) resources

At the municipality level, we assume that government resources are important in providing opportunities for children to go and stay in school, especially because in the Indonesian decentralized system substantial financial resources and autonomy are distributed to the local government level to implement programs and improve social services (Sjahrir & Kis-Katos, 2011). This makes local governments crucial actors in providing access to education. In such a decentralized structure, we expect variation at the local level, because local governments will differ in their public education expenditures. Such variations may influence the affordability of schools for households. For example, public schools in Indonesia collect various fees from parents, in order to support non-routine activities. Private schools accumulate fees for both routine and non-routine activities, except for primary and junior secondary education as part of universal compulsory education.

One important variation is that some local governments have decided to reduce the school fee, whereas others have not (Handa, 1999; The World Bank, 2003, Barrera-Osorio, Linden, & Urquiola, 2008). Several municipalities provide schools with money from the operational assistance fund (*Bantuan Operasional Sekolah Daerah*/BOSDA) on the condition that the school reduces or abolishes school fees. As a result, schooling might become more affordable or even free, especially for the nine-year compulsory education.

The school cost average is $52 ranging from free (0) to $6,693 while the average expenditure per capita is $ 2,641 ranging from $215 to $141,921 (Calculated from Susenas, 2010). Lower costs for education are expected to motivate parents to send their children to school, given that the costs of schooling, including fees, are often a key reason for parents to not send their children to school or to let them dropout (Rose & Al Samarrai, 2001; Hunter & May, 2003; Liu, 2004; Ackers *et al*., 2001 in Mukudi, 2004). For example, a study of educational stakeholders in Ethiopia and Guinea showed that inability to pay the direct costs of schooling was one of the most important causes of non-attendance in both countries (Colclough *et a*l., 2000). In addition, some local governments also decided to provide more scholarships that might attract poor pupils to return to or enroll in the schooling system. This can be another incentive for parents to send their children to school. Based on these affordability arguments, *we predict that the lower the local government's public education expenditure per capita the more likely children are (a) to never attend school and (b) to drop out from school (H1)*.

Second, households residing in municipalities with higher poverty rates often lack community investment in child development (Pusponegoro, 2013). Consequently, they are likely to receive less social and economic support for child development, which may in turn reduce opportunities to go to school (Brooks-Gunn & Duncan, 1997). For example, a study in the US showed that the higher the neighborhood poverty rate the more boys were likely of dropping out of school (Clark, 1992). Therefore, *we predict that the higher the poverty rate of a municipality, the more likely children will (a) never attend school and (b) drop out from school (H2)*.

Third, parental investment decisions need to be made regarding the educational expenditures of their children. Parents' decision to invest in the education of their children might be influenced not only by the level of wealth but also by the community's aspirations as to education. The context and community in which they reside shape parents' decisions on educational investments. For instance, parents living in a municipality which highly values education might feel pressured to invest more in education. Conversely, parents residing in a municipality which values education less may invest less in education. We suggest that a municipality's mean household education expenditure reflects community aspirations, and these are part of the perceived opportunity structure (Shahnaz & Naeem, 2012). Consequently, *we expect that the lower the municipalities mean household education expenditure, the more likely children are to (a) never attend school or (b) drop out from school (H3)*.

2.2.2 The impact of household socio-economic status (SES)

At the level of the household, we expect that income, educational investments, parents' educational level, household structure, and distance to school are important factors in parents' decisions on education. First, economically better off households can be assumed

to have more opportunities and resources for spending money on their children's education (McNeal, 1999; Teachman *et al.*, 1996). Less wealthy parents may either need their children to contribute to the household income, through wage-earning employment, or ask their children to take on additional tasks to free other household members for paid work (Suharti, 2013). Consequently, parents may decide not to send children to school or withdraw them from school. Additionally, household expenditure may be influential because people with more money tend to spend more money on non-basic needs, such as children's education, which decreases the probability that children are out of school. Handa's findings in Mozambique (1999) confirmed that household income significantly influences schooling choices. Consequently, *we expect the lower the household expenditure per capita in the household, the more likely that children will (a) never attend school or (b) drop out from school (H4).*

Second, parents' or caretakers' investments in education are associated with the degree of awareness of the importance of education. In modern societies, parents have fewer opportunities to achieve a good position in society for their children through direct occupational transmission or through the transfer of capital (Blau & Duncan, 1967; Treiman & Ganzeboom, 1990). As a result, education becomes more important as a vehicle of social mobility, which increases the importance parents attach to education, and therefore the price they are willing to pay. They also need to weigh off the future benefits of sending their children to school compared to the direct costs. The household education expenditure per capita thus partly reflects how parents value education: it is not only determined by household wealth but also by parents' values and preferences for education. If they value education, then we expect them to invest more in education. As a result, *we predict that the lower household education expenditure per capita, the more likely that children (a) never attend school or (b) drop out from school (H5).*

Third, and related to the above, the parent's own educational attainment matters for their decisions on educational investment (Becker & Nigel, 1994). In line with opportunity structure theory, human capital theory points out that the objectives, availability of resources and constraints may determine parents' investment decisions regarding their children's education. Those objectives, resources, and constraints affect their preferences and expectations regarding their children's education (Haveman & Wolfe, 1994). Highly educated parents strongly prefer to increase their children's education because they recognize the importance of education. As a result, parental education is a prominent determinant of children's education and employment. Higher parental levels of education are associated with increased access to education and lower dropout rates in their children (Rose & Al Samarrai, 2001; Connelly & Zheng, 2003; Hunter & May, 2003; Duryea, 2003; Ainsworth, Beegle, & Koda, 2005; Ersado, 2005; Grant & Hallman, 2006). Non-educated parents often do not appreciate the benefits of schooling (Juneja, 2001; Pryor & Ampiah, 2003) and often cannot provide appropriate support for the children's education, which negatively influences their children's achievement and motivation. Thus, *we expect that the lower the educational level of the*

household, the more likely children are (a) to never attend school or (b) to drop out from school (H6).

Fourth, the household structure affects the availability of resources. Especially in female-headed households, children might be more constrained to go to school, because women in the developing world tend to be disadvantaged relative to men in their access to assets, credit, employment, and education (Lloyd & Blanc, 1996; Kennedy & Peters, 1992). Therefore, we expect that female-headed households are more disadvantaged than male-headed households, and that they are thus less able to invest in the education of their children. This is confirmed in empirical analyses in India (cf. Kumari, 1989). We therefore *expect that children in female-headed households are more likely to never attend school (a) or (b) will drop out from school (H7).*

Finally, accessibility is crucial for children to be able to attend school, as previous studies show (King & Lillard, 1983; Deolalikar, 1997; Alisjahbana, 1999; Handa, 1999; Amin & Suran, 2005; Gitter & Barham, 2007). Access can be hindered by the distance children have to travel to school. Especially in remote areas with poor transportation infrastructures, households in villages without a school may face prohibitive transportation times and costs. Parents might find it too dangerous to send their young children to another village and might wait until their children are older. As a result, *we expect that school availability decreases the likelihood of children (a) never attending or (b) dropping out of school (H8).*

2.3 Data, measurement and analytical procedure

2.3.1 Data

We combined three official datasets. First, we used the national socio-economic survey (*Survei sosial ekonomi nasional*/Susenas) 2010 from the Indonesian Central Bureau of Statistics (CBS) consisting of 1,178,494 individuals with 114 variables in 293,715 households with 134 variables. From this dataset, we selected the population aged 7-15 years, since it represents the official school ages during nine years of compulsory education (primary and junior secondary education). This selection results in 221,392 children in 136,182 households nested in 497 municipalities. Second, we used the Village Potential Statistics (*Potensi Desa*/Podes) from the CBS (2011). This dataset provides information on village characteristics throughout Indonesia, with a size of about 65,000 villages. Third, we used the local government expenditure (LGE) dataset of 2010 as provided electronically by the Ministry of Finance (MoF, 2013). It contains 479 districts/municipalities, which is fewer than the Susenas dataset because decentralization in Indonesia led to newly created districts and municipalities. To reconcile the Susenas dataset (497 municipalities) and the LGE dataset (484 municipalities after separating five municipalities), we added the data of the main municipalities for educational expenditure

to the new established municipalities (13 municipalities), giving the same total of districts/municipalities as the Susenas dataset (497 municipalities).

2.3.2 Measurements

Dependent variables
School enrolment was measured as a categorical variable with three categories: "1" never attended school, "2" currently attending school (used as a reference category) and "3" not attending school anymore. Table 2.1 shows that 94.9 percent of children attended, approximately 3.6 percent were no longer enrolled and 1.5 percent had never attended school.

Independent variables
At the municipality level, we constructed three predictors: The first predictor is municipality education expenditure per student. It is constructed from the municipality education expenditure divided by the number of students in primary and junior secondary school, adjusted by the poverty line in each municipality to ensure comparability with the average Indonesian rupiah (IDR) 221,660 (SD 143.82), ranging from IDR 5,370 to IDR 1,737,270. Then, to reduce the undue influence of large expenditure per capita, we take the log of these numbers, ranging from 1.68 to 7.46 as exhibited in Table 2.1. The second predictor is the mean of municipal household education expenditure. This is taken from an aggregate of the household education expenditure per capita, adjusted by the municipal poverty line with average IDR 76,460 (SD 52.81), ranging from IDR 4,660 to IDR 383,470. We also converted these numbers to the log, ranging from 1.54 to 5.95. The third predictor is the municipality's poverty rate. It is created from aggregating the household poverty status in a municipality, with an average of 15.5 percent, ranging from 2 percent to 50 percent.

Table 2.1 Descriptive statistics $N_{level1}=221,392$; $N_{level2}=136,182$; $N_{level3}=497$

Levels and variables	Min	Max	Mean	Std. Dev.
School participation (N=221,392)				
Never	0	1	.015	
Enrolling	0	1	.949	
Not_anymore	0	1	.036	
Level 3 - Municipality (N=497)				
Log of municipality public education per pupil	1.68	7.46	5.256	.545
Log of municipality's mean household education expenditure	1.54	5.95	4.129	.670
Poverty rate at municipality	.02	.50	.155	.094
Level 2 - Household (N=136,182)				
Log Expenditure percapita	3.08	9.83	5.825	.491
Head of household education: *Below primary (ref.)*	0	1	.220	
- *Primary*	0	1	.326	
- *Junior secondary*	0	1	.162	
- *Senior secondary and more*	0	1	.292	
Head of household gender	0	1	.087	
School availability at village	0	1	.940	
Level 1 - Child (N=221,392)				
Sex	0	1	.482	
Age (10.9 years as mid for centring)	7	15	10.883	2.574
Relation to head of household: *Child (ref.)*	0	1	.881	
- *Grandchild*	0	1	.077	
- *Relatives*	0	1	.037	
- *Others*	0	1	.005	
Control variables at household level (N=136,182)				
Household size	1	24	4.931	1.663
(ref.)	0	1	.645	
- *One child*	0	1	.301	
- *Two children*	0	1	.049	
- *Three children*	0	1	.005	
- *Four children and more*	0	1	.001	
Household poverty status (1= poor)	0	1	.150	
Place of residence (1= urban)	0	1	.395	
Head of household source income: *Agriculture (ref.)*	0	1	.442	
- *Mining, industry and construction*	0	1	.164	
- *Services*	0	1	.365	
- *Others*	0	1	.029	

At the household level, five measures were used: (1) household expenditure per capita adjusted by the poverty line in each municipality with average IDR 389,640 (SD 291.12), ranging from IDR 21,680 to 18,519,150. We then transformed this to the log of household's expenditure per capita adjusted by the poverty line with average 5.825 (SD .491), ranging from 3.08 to 9.83 as displayed in Table 2.1; (2) household's education expenditure per pupil adjusted by the poverty line in each municipality with mean IDR 91,090 (SD 328.86). We coded "0" for households that do not spend money on education and "1 to 20" for 20 group percentiles of household education expenditure. We also coded them in binary with "0" as no spending on education and "1" for household spending on education; (3) heads of household's education level consisting of "1" for below primary/none (22.0%), "2" for completed primary (32.6%), "3" for completed junior secondary (16.2%), "4" senior secondary and more (29.2%); (4) female-headed household coding "0" for male and "1" for female with only 8.7 percent of households being female-headed; (5) accessibility with "1" as school available in village or less than three kilometers away for primary school and six kilometers away for lower secondary school (according to the official definition of accessibility), and "0" for unavailable. In general, schools are accessible in 94 percent of the cases.

Control variables

We include children's characteristics and other household's characteristics as control variables. Children's characteristics matter for school attendance and dropout. Three have been found to be particularly important. Firstly, girls are more likely to drop out because gendered practices at the household level affect opportunities for girls, especially in developing countries. Studies indicate that many households prefer to educate boys rather than girls (*cf.* Rose & Al Samarrai, 2001; Boyle, Brock, Mace, & Sibbons, 2002; Admassie, 2003). Secondly, older children are more likely to be out of school because growing older increases the opportunity cost of their time that leads to drop out (*e.g.* Admassie, 2003; Ersado, 2005). For instance, the enrolment rates in India, Pakistan and Bangladesh drop sharply as children get older, especially from 7-10 years (UNESCO, 2008). Thirdly, a child's relationship to the head of household is a strong predictor of dropout or being out of school. Children raised in intact families complete more total years of education than those in other types of family structures (Powell & Parcel, 1997). Moreover, findings from South Africa show that children living with grandparents are significantly less likely to drop out of primary school when compared to other family structures (two-parent nuclear and single-parent), with non-relatives 3.4 times more likely to drop out (Sibanda, 2004).

Children's characteristics are important factors explaining why children are out of school but they are not the focus of our analysis. Therefore, we treat children's characteristics as control variables. At the individual level: (1) gender is coded "0" for boy and "1" for girl. Table 2.1 illustrates that the children are distributed almost equally across gender, with about 51.8 percent boys and 48.2 percent girls; (2) a child's age centered

around the mean age. Table 1 shows that children's ages range 7–15 years, the official ages for attending primary and junior secondary school in the Indonesian education system, with an average age 10.9 years (SD 2.57); (3) a categorical variable expressing the child's relation to the head of household, with "1" for child, "2" for grandchild, "3" for relatives and "4" for others. The data reveal that the majority of children are the son or daughter of the head of the household (88.1%); some are grandchildren (7.7%), or relatives (3.7%) and only a few are not an immediate relative (.5%).

At the household level, the following control variables were used: (1) household size, ranging from 1 to 24 (average being 4.9, SD 1.663); (2) households with a child below five years, consisting of none as "0" with about 64.5 percent, one child as "1" (30.1%), two or three children as "2" (4.9%) and "3" (0.5%) correspondingly, and four and more children as "4" (0.1%); (3) poverty status, with "0" for not poor and "1" for poor households, approximately 15 percent; (4) place of residence, with "0" for rural and "1" for urban, with about 39.5 percent residing in urban areas, (5) source of household income, with "1" for agricultural,(44.2%), "2" for manufacturing/mining (16.4%), "3" for services (36.5%) and "4" for others (2.3%).

2.3.3 Analytical procedure

Multilevel multinomial regression analysis (cf. Snijders & Bosker, 2012; Hox, 2010) using MLwiN 2.35 (Rasbash, Steele, Browne & Goldstein, 2015) was applied. This method allows us to consider the hierarchical nature of our data, and permits us to test the effects of children, household and municipal level variables (Snijders & Bosker, 2012). A sequence of models was estimated, building up from the individual level, to test the hypotheses at all levels, including control variables at the household level. The models were estimated using Markov chain Monte Carlo (MCMC) estimation with initial burn-in length of 20,000. This was followed by a monitoring chain with length 50,000 (with the final model rerun with 50,000 burn-in and 100,000 chains).

2.4 Results

To examine those children who are out of school within households and municipalities, we started our analysis by estimating a null model that included two random intercepts to compare both children who never attend school and children who dropped out from school to the reference category (children attending school).

Table 2.2 Multilevel multinomial regression analyses for children aged 7-15 with never attend and dropout from school as dependent variables

Variables	Model 1				Model 2			
	Never		Not anymore		Never		Not anymore	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Intercepts	5.344	(0.747)	8.417	(0.586)	2.113	(0.855)	5.793	(0.786)
Level 3 - Municipality								
Municipality education expenditure percapita (Log)	0.034	(0.083)	-0.140	(0.070) *	0.022	(0.085)	-0.175	(0.068) **
Municipality poverty rate	2.866	(0.595) ***	-3.699	(0.497) ***	2.868	(0.578) ***	-3.795	(0.507) ***
Mean of municipality household education	-0.311	(0.089) ***	-0.152	(0.071) *	-0.265	(0.093) **	-0.105	(0.073)
Level 2 - Household								
Expenditure per capita (Log)	-0.833	(0.055) ***	-1.203	(0.040) ***	-0.410	(0.077) ***	-0.860	(0.065) ***
Head of household education: *Below primary (Ref.)*								
- *Primary*	-0.468	(0.057) ***	-0.437	(0.040) ***	-0.433	(0.057) ***	-0.415	(0.041) ***
- *Junior secondary*	-0.691	(0.079) ***	-1.120	(0.060) ***	-0.635	(0.079) ***	-1.068	(0.060) ***
- *Senior secondary & more*	-0.714	(0.076) ***	-1.298	(0.059) ***	-0.690	(0.081) ***	-1.272	(0.061) ***
Head of household sex: *Male (Ref.)*								
Female	0.041	(0.081)	0.082	(0.055)	0.212	(0.082) **	0.322	(0.058) ***
School available at village: *Unavailable (Ref.)*								
available	-0.453	(0.070) ***	-0.072	(0.069)	-0.437	(0.071) ***	-0.055	(0.072)
Level 1 - Individual								
Child sex: *Boy (Ref.)*								
Girl	-0.120	(0.045) **	-0.390	(0.032) ***	-0.123	(0.045) **	-0.397	(0.032) ***
Age (grandmean)	-0.144	(0.009) ***	0.643	(0.011) ***	-0.154	(0.009) ***	0.642	(0.010) ***
Relation to head of household: *Child (Ref.)*								
- *Grandchild*	-0.285	(0.094) **	-0.466	(0.073) ***	-0.441	(0.095) ***	-0.514	(0.073) ***
- *Relatives*	0.351	(0.107) ***	0.495	(0.068) ***	0.245	(0.108) *	0.456	(0.070) ***
- *Others*	0.990	(0.254) ***	2.168	(0.141) ***	0.607	(0.258) **	2.038	(0.143) ***

*Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Table 2.2 Multilevel multinomial regression analyses for children aged 7-15 with never attend and dropout from school as dependent variables **(Continued)**.

Variables	Model 1				Model 2			
	Never		Not anymore		Never		Not anymore	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Control variables at Household level								
Household size					0.162	(0.013) ***	0.154	(0.011) ***
Member household below 5 years: *Zero (Ref.)*								
- One child					-0.160	(0.053) **	0.023	(0.040)
- Two children					-0.342	(0.092) ***	-0.009	(0.077)
- Three children					-0.257	(0.205)	-0.034	(0.201)
- Four and more children					-0.774	(0.445)	-1.084	(0.507) *
Household poverty status: *Nonpoor (Ref.)*								
Poor					0.263	(0.069) ***	0.099	(0.056)
Household residence: *Rural (Ref.)*								
Urban					-0.021	(0.066)	-0.128	(0.044) **
Household source income: *Agriculture (Ref.)*								
- Mining, industry, construction					-0.173	(0.081) *	-0.083	(0.052)
- Service					-0.178	(0.071) **	-0.191	(0.048) ***
- Others					-0.191	(0.171)	-0.651	(0.121) ***
Random Part								
Level 3 - Municipality								
Constants	0.704	(0.068)	0.521	(0.048)	0.686	(0.067)	0.491	(0.046)
Cons.Not anymore/cons.Never	0.170	(0.041)			0.137	(0.039)		
Correlations	0.281				0.236			
Level 2 - Household								
Constants	0.061	(0.021)	2.034	(0.138)	0.006	(0.001)	2.057	(0.117)
Cons.Not anymore/cons.Never	0.064	(0.045)			0.025	(0.011)		
Correlations	0.173				0.219			
-2*loglikelihood:								
DIC:	60,020				59,621			
pD:	7,020				6,923			

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001.*

The multilevel multinomial analyses show that several child-level characteristics are related to the likelihood of children being out of school. Model 1 in Table 2.2 reports that children's characteristics explain the probabilities of children not at school. Compared to boys, girls are less likely to never attend and drop out from school. As expected, the age of children out of school has different effects. Growing older significantly decreases the probability of children never attending school but it increases children's chances to have dropped out from school. Position in household is also significantly related to the likelihood of non-attendance. Compared to the position of a child, being the grandchild of the head of household significantly decreases the likelihood of children to never attend or drop out from school. In contrast, in the position of a relative or 'other' significantly increased the likelihood to never attend and drop out from school.

2.4.1 The impact of variations in municipality characteristics

We now turn to the hypotheses formulated on the educational opportunity structure at the municipality level. As autonomous government entities, municipalities have a crucial role in providing primary and secondary education services and thus in facilitating opportunities for households to send their children to school. However, the municipality capacity to provide accessible and affordable school varies. Our first hypothesis proposed that the lower the local government's public education expenditure per capita, the more likely children are (1a) to never attend school and (1b) to drop out from school. The multilevel multinomial analyses show that local government's public education expenditure per capita does not have a significant effect on decreasing children's likelihood to never attend school, both with and without taking into account the control variables at household level (β=.034 SE .083 and β=.022 SE .085, respectively) as exhibited in Model 2 (final model) of Table 2.2. Taking into account the variables at the household level as the final model provides clear evidence to refute hypothesis 1a: government expenditure does not decrease the likelihood of children never to attend school.

The results also show that the higher the local government's public education expenditure per capita, the lower the likelihood of children to drop out after taking into account all individual-level variables (β=-.140 SE .070). Considering all household-level variables, the coefficient estimate increases slightly to -.175 SE .068. Thus local government interventions as represented by public education expenditure per capita significantly reduce children's chances to drop out from school. Hypothesis 1b is thus supported.

The second set of hypotheses suggested that the higher the poverty rate of a municipality, the more likely that children would (2a) never attend school or (2b) drop out from school. We found that the model results support hypothesis 2a. After taking into account all individual, household, municipal level variables, the final results given in

Model 2 (Table 2.2) shows that residing in a municipality with a higher poverty rate significantly increases the likelihood of children never attending school (β=2.868 SE .578). Meanwhile, the results show that the higher the poverty rate of a municipality is significantly associated with a lower likelihood of children dropping out from school (β=-3.795 SE .507).

Hypothesis 3 predicted that the lower the municipalities' mean household education expenditure, the more likely those children (3a) never attend school or (3b) drop out from school. Without taking into account the variables at the household level, the results of Model 2 in Table 2.2 show that a high(er) municipality mean household education expenditure significantly reduces the likelihood of children to never attend school (β=-.331 SE .093) and drop out from school (β=-.152 SE .071). However, after including all household-level variables, the results change for children who drop out from school. The results suggest that a high municipality's mean household education expenditure is not significantly related to the likelihood of children to drop out from school (β=-.105 SE .073). These findings partially support hypothesis 3a: the higher the municipality's mean household education expenditure the more likely that children never attend school (β=-.243 SE .076) but there is no clear evidence of such relationship for children's dropping out from school (3b).

2.4.2 The impact of household characteristics

We also looked at the impact of household attributes and their effect on children's school enrollment. Model 2 in Table 2.2 presents the effects of household expenditure per capita, household education expenditure per capita, female-headed households, school (un)availability as proxy for school distance, and head of household's educational background on children out of school.

The fourth set of hypotheses predicts that the lower the household expenditure per capita, the more likely children will (4a) never attend school or (4b) drop out from school. After taking into account all individual, household and municipal levels and control variables, our results in Model 2 of Table 2.2 fully support these hypotheses 4a and 4b. The results suggest that a high(er) household expenditure per capita diminishes the likelihood of children never attending school (β=-.410 SE .077) and dropping out from school (β=-.860 SE .065). The patterns of household expenditure for children who never attend school and who drop out from school are almost similar but the effect size of the household expenditure per capita is significantly larger in reducing the likelihood of children's dropping out from school than the likelihood of never attending school.

The fifth set of hypotheses suggests that the lower household education expenditure per capita, the more likely it is that children will (5a) never attend school or (5b) dropout from school. The results in Model 2 of Table 2.2 support these expectations. Findings show that the household education expenditure per capita significantly reduces

the likelihood of children both never attending (β=-4.681 SE .059) and dropping out from school (β=-4.795 SE .074). We also found that after including the variables at household level, the coefficient increased slightly both for children not attending school and dropping out from school. Although the patterns of household education expenditure per capita for children who never attend school and who drop out from school are in a similar direction, the magnitude of the household education expenditure per capita on lowering the likelihood of children's never attending school is larger than those of children's dropping out from school.

In addition, we examined both decile and percentile groups of the household education expenditure per capita and their effects. The results (not shown in Table 2.2) reveal that even though the household education expenditure per capita significantly decreases the likelihood of children being out of school, there is no difference in estimated effects among either decile or percentile groups of the household education expenditure per capita. Based on these results, we used the binary household education expenditure variable in the final model to simplify the model.

The sixth set of hypotheses predicts that the lower the educational level of the household head, the more likely children are to never attend school (a) or to drop out from school (b). After including all individual, household, and municipal levels and control variables, Model 3 in Table 3 shows that compared to heads of households with below primary school education, a higher educational level of the head of the household significantly decreases the likelihood of children being out of school. Moreover, compared to children living in households where the head's education is below primary, children from households whose heads completed primary, junior and senior secondary or higher education are less likely to never attend school by β=-.433 (SE .057), β=-.635 (SE .079) and β=-.690 (SE .081), respectively.

Additionally, the same patterns are found for children who drop out from school but the estimated effects are bigger than for those who never attend school with β=-.415 (SE .041), β=-1.068 (SE .060) β=-1.272 (SE .061), respectively. In summary, our findings fully support the hypotheses that the lower the education level of the household head, the more likely children are to never attend school (6a) or to drop out from school (6b).

The seventh set of hypotheses states the expectation that children in female-headed households are more likely to (7a) never attend school or (7b) dropout from school. Before considering the control variables at the household level, no significant association is found between female-headed households and the likelihood of children attending school and dropping out from school, as illustrated in Model 1 of Table 2. After including the variables at the household level, Model 2 of Table 2.2 reveals that being part of a female-headed household increases the children's probability to never attend school (β=-.212 SE .082) and to drop out from school (β=-.322 SE .058). The analysis also suggests that the effect of the female-headed households on children to drop out from school is stronger than on those never attending school. Hypotheses 7a+b are thus supported.

Finally, the eighth set of hypotheses predicts that school availability decreases the likelihood of children to (8a) never attend or (8b) dropout from school. When we look at Models 1 and 2, we see that the effects of school availability are mainly the same. The findings reveal that school availability significantly reduces the children's likelihood of never attending school and this associated negatively although not significantly with children's chances for dropout. Then, after including the variables at the household level, Model 2 in Table 2.2 illustrates that the results are almost similar. School availability in a village significantly diminishes the likelihood of children to never attend school (β=-.437 SE .071) but it is insignificantly related to reduce the likelihood of children to drop out from school (β=-.055 SE .072).

All in all, the findings suggest that if schools are unavailable in a village and there is a need to transport children more than three kilometers for primary school and more than six kilometers for junior secondary school, children are less likely to attend school. Therefore, school availability significantly reduces the probability of children to never attend school (8a). This indicates that school unavailability is important to understand why some children never attend school but seemingly it is not a defining factor to explain why children drop out from school (8b). Concerning accessibility, as indicated by school availability in a village and distance to school, our findings reveal that the effect of school availability on children never attending school is stronger than for children dropping out.

We have summarized the results of all our analyses in Table 2.3.

Table 2.3 Overview of the hypotheses and findings of our analyses

No.	Hypotheses	Never attend school (a)	Drop out from school (b)
1	The lower the local government's public education expenditure per capita the more likely children are (a) to never attend school and (b) to drop out from school.	X	√
2	The higher the poverty rate of a municipality, the more likely those children will (a) never attend school and (b) drop out from school.	√	X
3	The lower the municipalities mean household education expenditure, the less likely the proportion of children who (a) never attend school or (b) drop out from school.	√	X
4	The lower the household expenditure per capita in the household, the more likely that children will (a) never attend school or (b) drop out from school.	√	√
5	The lower household education expenditure per capita, the more likely that children (a) never attend school or (b) drop out from school.	√	√
6	The lower the education level of the household had, the more likely children are (a) to never attend school or (b) to drop out from school.	√	√
7	Children in female-headed households are more likely to children never attend school (a) or (b) drop out from school.	√	√
8	School availability decreases the likelihood of children (a) never attend or (b) drop out from school.	√	X

Notes:
√ = The findings are in line with the hypothesis.
X = The hypothesis is rejected by the findings.

2.5 Discussion and conclusions

This paper sought to answer the question of which characteristics of municipalities, households and children explain why children never attend or drop out from school in Indonesia. Opportunity structure theory was used to argue that macro and micro attributes at both municipal and household levels facilitate or constrain children from attending school.

Using a multilevel approach, we included school affordability measured at the municipality level by the public education expenditure per capita, the poverty rate, and the mean of household education per capita. At the household level we used household education expenditure per capita, household education per capita, head of household educational background, and female-headed household, and school availability in a village. In addition, we incorporated important child characteristics, consisting of age, gender and relation to head of household.

2.5.1 Impact of the municipality level

The hypotheses at the municipal level were supported only partially. First, efforts to improve access to schooling as indicated by the public education expenditure significantly reduce the likelihood that children drop out from school but no clear evidence was found that they decrease children's likelihood to never attend school. One may conclude from this that the government – through its expenditure – can help prevent children from dropping out from school but it may not help sufficiently to attract/encourage all children to attend school for the first time, such as children isolated in remote areas and street children in urban areas.

However, the association between municipality education expenditure and school enrollment might be related to other factors as well. Our analyses did not include information on the type of activities financed by the education budget or the quality and process of public education spending. For example, corruption might be an important obstacle to effective and efficient government spending. Public education expenditure appears to have a positive and relatively large effect in less corrupt regions (Suryadarma, 2012). Also, the ranking on the transparency and allowance index – part of the World Bank governance index – is significantly associated with an increase in enrollment rates (World Bank, 2013). Corruption also influences the effectiveness of educational interventions. Suryadarma's analysis (2012) confirmed this: higher perceived levels of corruption decrease the effectiveness of public education spending on enrollment. Our analyses could not shed light on the effect of these matters.

Second, regarding municipality poverty rate, our findings showed that residence in a municipality with a higher poverty rate significantly increases the likelihood of children to never attend school but it decreases the likelihood of children dropping out. This

suggests that the poverty rate at the municipal level has an opposite effect on children to never attend or drop out from school. These interesting findings could be explained as follows.

Firstly, the industrialized municipality might increase the average household income and provide job opportunities in the unskilled labor market. This may attract children to work and that leads to their dropping out from school. Because jobs are not available in non-industrialized municipalities, children residing there may stay longer at school. This situation is supported by the finding that children who live in households whose head works in the transportation, storage and communication sector have an increased likelihood to drop out from school (McCulloch & Grover, 2010).

Secondly, the central government significantly increased educational expenditure since 2009 as mandated by constitutional amendments. The budget was spent mainly on students completing universal compulsory education. As a result, primary and junior secondary schools, included in universal compulsory education, benefited from this policy. This is in line with previous experiences in economic crises, which showed that educational interventions such as providing nation-wide scholarships successfully prevented children from dropping out from primary school (Sparrow, 2007). This policy provides more scholarships to higher poverty rate municipalities and that might be reducing the dropout rate. Since scholarships are distributed to children in school, not to children out of school, this policy will not decrease children's likelihood of never attending school.

These different results imply that wealth and type of income are very important to understanding the likelihood of children never attending and dropping out from school. For instance, the poverty status of female-headed households is higher (16.8%) than those of male-headed households (14.9%) because the proportion of unemployed head-of-households is larger for the female-headed households (14.9%) than for male-headed households (1.8%).

Furthermore, the results show that the higher the municipality's mean of household education expenditure, the higher the children's likelihood of never attending school. Although the municipality's mean of household education expenditure is also related to reducing children's likelihood of dropping out, the effect is not strong enough to be significant. This thought-provoking finding implies that the size of average household education expenditure could be explained by other factors, which by themselves could be sufficient to have children stay at school. For instance, some municipalities had decided to abolish school cost with a consequent reduction in average household education expenditure at the municipality level (Paqueo & Sparrow, 2005). In addition, school-based management policy enables schools to determine their own school fee or make it free. This might increase school fee variations (Yonezawa & Muta, 2001). Consequently, the effect of the mean of household education expenditure may be weaker.

2.5.2 Impact of household and individual levels

At the household level, factors such as a household's wealth, investment in education and educational background of the head of the household are all significantly related to reduce children's' never attend and dropout rates. If the household is richer, invests more in education, and the household head has a higher level of education, the likelihood of children to never attend and dropout from school decreases significantly. Meanwhile, the fact that a woman is head of the household is not significantly related to the likelihood of children attending and dropping out but this relationship becomes significant after including the variables at the household level. It indicates that variables such as poverty and source of income are very important for the children's likelihood to never attend and drop out from school if they live in a female-headed household, mainly unemployed widows.

The findings show that school availability decreases the likelihood of children to never attend school but does not mitigate the chance of dropping out of school. If we look at the municipal level, these different mechanisms could be explained by the opportunity structure as follows. The proportion of children never attending school ranges from 10–87 percent in 16 municipalities in Papua Island (calculated from Susenas, CBS 2010). It indicates that the reasons for parents not sending their children to school may relate to school distance, difficult transportation and lack of infrastructure. When there is no school in or near the village, there is no alternative for children to go to school and parents hesitate to send their children to a school a long distance away. Hence, school distance is a constraint for the head of the household sending children to school.

Surprisingly, the largest proportion of dropout, ranging from 8–10 percent does not occur in Papua Island (calculated from Susenas, CBS 2010). This indicates that school availability in a village is not clearly related to children dropping out from school. The dropout rate probably relates to labor market opportunity both in industrialized municipalities, such as Gorontalo, Serang, Bogor, Purwakarta, Cirebon and in agricultural municipalities, such as Bantaeng, Wajo, Hulu Sungai Selatan, Polewali Mamasa (Calculated from Susenas, CBS 2010). While job opportunities in industrialized municipalities attract children to drop out from school permanently, similar opportunities in agriculture municipalities attract children to work temporarily. Those job opportunities become a constraint for children going to school. Surprisingly, seven municipalities with zero dropout are mainly in Papua Island (six municipalities) (calculated from Susenas, CBS 2010).

At the individual level, girls are more likely to attend and stay in school. Growing older significantly decreases the likelihood of children to never attend school but increases the likelihood of children dropping out from school. Regarding the likelihood to never attend and drop out from school, the best position in a household is grandchild and the worst is other, such as a maid.

School non-participation has always been linked to a limited opportunity structure in developing countries. Our findings suggest that in the Indonesian case, resources (expenditure and education) matter, especially at the household level. However, the impact of various components of the opportunity structure at the municipal, household and individual level are mixed and interrelated. We found that factors explaining why children never attend and drop out from school are quite similar for most of the variables included, but are substantially different for a limited set of factors, namely, public education expenditure per capita, poverty rate per municipality, municipality's mean household education expenditure, and the availability of schools.

2.5.3 Policy implications

What policy recommendations can be inferred from this study? First, as this study shows, government expenditure can have a positive effect on preventing school dropout. However, one should be aware that the amount of government money alone does not entirely explain the effect of government interventions on children's school enrollment. Focus on spending and quality of spending, in terms of corruption for example, are potentially equally important explanations.

In terms of focus on spending, unfortunately our analyses could not shed light on the effect of various government interventions or educational activities on improving school enrollment. Also, we could not include indicators for the quality of spending. We are therefore careful to draw policy implications from the effect this study lacks, namely of government expenditure on children's likelihood to go to school for the first time. However, in combination with the strong positive effect of household wealth and head of household's educational level, which are stable and independent of all other factors and circumstances included, one could conclude that better off households with more knowledge are in a better position to send their children to school and keep them there. Therefore, one could consider the use of direct financial support to poorer households and empowering interventions as possible solutions, especially for children living in a female-headed household.

Our study might indicate that government intervention at the institutional level might not be the sole solution. Government interventions may need to shift gradually from providing institutional support at the national or regional level, to giving support channeled through institutions, such as municipalities and schools, to households and children, or to apply solutions at both institutional and individual levels simultaneously. New government interventions, such as household socio-economic empowerment, the national program for community empowerment (*program nasional pemberdayaan mandiri*/PNPM) and cash transfer programs (*bantuan tunai langsung*/BLT) may be promising initiatives in this respect, next to scholarships to children from poor families.

Finally, though school availability is no barrier for children in urban areas, it is still a constraint for children in rural areas, particularly in geographically challenging areas, such as Papua Island. Our results make clear that living in village without a school or with one located a long distance away substantially increases the likelihood of children never attending school. These findings imply that building schools in rural villages and remote areas might be a solution. If this is impossible due to the low population density in remote rural areas, an alternative might be to provide a "mini-school model" for primary school, and provide boarding schools and long-distance learning systems for junior high school (ISPA, 2013). This is how an important constraint to attending school could be overcome.

3

Household- and community-level factors of preschool participation in Indonesia: the moderating role of social capital[3]

Abstract

Preschool attendance has a wide range of beneficial effects on educational outcomes. Consequently, policy makers in many countries actively seek to increase preschool attendance rates, and Indonesia is no exception. At the same time, academic research has consistently shown that children from low-income households or poor communities are underrepresented in preschool. Drawing on social capital theory, we argue that high levels of household and community social capital not only lead to higher preschool enrollment rates, but also temper the negative effects of low socio-economic status on preschool attendance. Hypotheses on socio-economic status and social capital effects and their interaction were tested with Indonesian survey data, collected in 2009, on 43,879 children nested in 42,855 households in 14,774 villages. Multilevel logistic regression analyses indeed show the strong negative main effects of low socio-economic status. Preschool attendance is significantly lower for children from low-income, low-education households, and for children from poor or rural communities. Moreover, low levels of access to modern mass media significantly decrease preschool attendance. We found positive direct effects for two of the three social capital measures: household associations and community reciprocity; both increase preschool attendance. Household reciprocity tempers the negative effect of a low income on preschool enrollment. Our findings point towards the importance of social capital as a potential buffer for low-income households and communities. Policy implications are discussed.

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3.1 Introduction

Studies show that preschool attendance is beneficial for school readiness and success, since it leads to greater chances of completing high school, holding a job, and having higher earnings (e.g. Schweinhart *et al.*, 2005 in US and Armecin *et al.*, 2006 in the Philippines). For Indonesia, it has also been shown that children who participate in preschool do better in school (Irwanto, Pandia, Widyawati, & Irwan, 2011), are more healthy, engaged, productive and successful (Hasan *et al.*, 2013). Preschool also helps to make a smooth transition from home to school and prepares children to adapt to a learning environment (Arnold, Bartlett, Gowani, & Merali, 2006). All these attributes enable children to adjust easily to any new environment. In addition, a cost-benefit analysis indicates that for every $1 invested in preschool in Indonesia, a return of $6 can be projected; if the intervention focuses on the poor, its yield would reach $7 (World Bank, 2005).

However, still more than half of the eligible children in Indonesia are not in preschool (World Bank, 2015). Since preschool is so important for children's future lives, this paper aims to provide a better understanding of the factors that influence preschool enrollment in Indonesia as a first step in improving preschool enrollment rates. Although both academic scholars as well as governments, including that of Indonesia, have studied determinants of school enrollment, such as parent's income and education (e.g. Hasan *et al.*, 2013; Self & Grabowski, 2008; Knight & Song, 2000), particular research on preschool enrollment is less frequent than studies on education in general. This paper therefore aims to contribute to the general knowledge about determinants of preschool enrollment.

Explanations of preschool enrollment relate to both household and community levels. Important policy-related conditions identified as having a strong impact on preschool enrollment at the household level are socio-economic status, determined by household income and educational attainment (Barnett & Yarosz, 2007), and access to contemporary values through media (Delamaza, 2014). These three household-level conditions (income, education, information) relate to influential schools of thought: economic and sociological theories of development pointing to the importance of economic capital, human capital and modernization. Furthermore, these determinants, along with urbanization, are also important at the community level (UNICEF, 2006; Alderman, 2006).

In addition to the factors mentioned above, differences in social capital have also been found to have an important direct effect on education (cf. Coleman, 1988). Coleman defined social capital based on two common attributes: the presence of some aspect of social structures, and the facilitating of certain actions within structures, by individual or collective agents (Coleman, 1988, p. S98). Coleman's research showed that, in the US, information channels facilitate obligations, expectations and social norms, whereby social capital within the family and in the community reduces the probability of dropping out of

high school. Furthermore, social capital has been accepted as an important positive factor in children's educational outcomes (Smith *et al.*, 1995; Teachman *et al.*, 1996). This also applies to preschool enrollment.

Next to these direct effects, social capital can also indirectly impact education related decisions, in two ways. Firstly, the social capital of a household can be an effective buffer against the negative effect of low income and low parental education on children's academic outcomes (White & Kaufman, 1997). Secondly, it may complement other forms of capital (Robison *et al.*, 2002). Social capital may thus contribute to (or hinder) the effectiveness of policies aiming to enhance preschool enrollment through economic means or information campaigns. A third aim of this paper is, therefore, to focus on the moderating role of social capital on preschool enrollment in Indonesia.

In order to assess how household-level and community-level factors, including social capital, affect preschool enrollment, it is important to analyze these various determinants in their context. We focus on three context dimensions: household social capital, village social capital, and village context, including average wealth, modernization and urbanization. This study therefore addresses the following research question:

To what extent and under which conditions can variations in preschool participation be explained by differences in household-level and community-level factors like SES, modernization and urbanization, and what is the moderating role of social capital?

We study the case of Indonesia, a country traditionally characterized by dense social networks and many community organizations (Lasagni & Lollo, 2011). Furthermore, although basic education participation in Indonesia is almost universal, preschool enrollment is low, with a gross enrollment rate of about 51 percent (World Bank, 2015). Using a representative sample of households and villages drawn from the national socio-economic survey (Susenas) 2009, we estimate the effect of SES, modernization, urbanization and social capital on children's preschool participation by means of a multilevel logistic regression model. This model enables us to analyze the hierarchical nature of our data simultaneously at household and community levels (Snijders & Bosker, 2012). In addition to these direct or main effects, we also analyze the interplay between these factors and important characteristics of the community context by adding relevant interaction terms to the model. The results may be helpful for developing context-specific policy interventions to accelerate preschool participation.

The contributions of this paper are threefold. First, we contribute detailed insight into the interplay of important determinants of preschool enrollment in Indonesia, thus informing policy makers working on measures to improve preschool enrollment rates in the country. Second, we augment the general knowledge about determinants of preschool enrollment by providing at various levels a contextual analysis of important explanations of preschool enrollment. Third, we focus in particular on the moderating role of social capital, thereby unraveling the potentially buffering or compensating effect of this important resource.

3.2 The preschool system in Indonesia

The formal school system in Indonesia comprises primary to higher education levels, as stated by Law No. 20 of 2003 of the National Education Systems, article 15. However, before enrolling in primary school, some children attend formal or non-formal preschools that aim to cultivate interests, reading passions, curiosity, creativity and problem solving (Yuniarti & Hakim, 2014).

Formal preschools, such as kindergartens (*Taman Kanak-Kanak/TK* and *Raudhatul Atfhal/RA*), concentrate more on learning and have more structured ways of teaching, whereas non-formal preschools, such as play groups (*Kelompok Bermain/KB*), emphasize learning through playing (Hasan *et al.*, 2013). Next to these two types, other types of preschools are Integrated Health Service Units (*Posyandu*), child care centers (*Taman Penitipan Anak/*TPA), early child education and development centers (ECED or *Program Anak Usia Dini/*PAUD) and toddler family groups (*Bina Keluarga Balita/*BKB), which are available in most communities for child development.

Officially, children between the ages of 4 and 6 will enroll in kindergartens and ECED posts. However, depending on variations in local conditions like availability and accessibility, some children aged 4 to 5 years may still attend playgroups; most children aged 6 years have already started the first grade of primary school (Jung & Hasan, 2014). In terms of the services provided, preschools are varied. For instance, child care centers (CCC) and ECED are available 5-6 times per week but ECED is open mainly from 8 to 11 in the morning, whereas the CCC provide services almost all day, from 8 a.m. to 4 p.m. Posyandu is open only once a week, whereas playgroups meet at least 3 days a week (Hasan *et al.*, 2013).

The majority of both formal and non-formal preschools is privately run and managed (Hasan *et al.*, 2013). While non-formal preschools are almost free, formal preschool tuition fees vary from none to highly expensive fees, as in the case of an international preschool that costs more than IDR 200 million, or approximately $16,250, per year.[4]

Unlike the nine-year compulsory education system, preschools were not a policy priority of the government until the reform era started in 2001. Whereas the focus of the government in the first years of the reform era was on improving access to school for 7 to 12 year olds by increasing the numbers of primary schools, preschool participation rates of children aged 3-6 years remained low, at 30 percent in 2005 (CBS, 2005).

Since 2003, the government has been fully committed to providing preschools (early childhood education, ECE) and has emphasized this as a policy priority in the National Program for Indonesian Children and the Education for All National Plan Action (World Bank, 2006). To improve the access of poor children to preschools, the

[4]https://www.jisedu.or.id/data/files/gallery/ContentGallery/FEE_SCHEDULE_FOR_2015__New_Students_non_US_Embassy_IDR_NOVEMBER_2015_5Nov20153.pdf

government implemented the early childhood development project from 2006 until 2012. This project includes three main activities: (1) training of facilitators to promote community awareness of the importance of preschools and prepare proposals for block grants; (2) providing block grants of about $18,000 per village for three years to establish two centers (preschools); (3) training preschool teachers so as to provide two teachers per center (Hasan *et al.*, 2013). The project covered 738,000 children from 6,000 poor communities situated in 3,000 villages (Pradhan *et al.,* 2013).

Additionally, the government has financed a *national program* for community empowerment (*Program Nasional Pemberdayaan Masyarakat*/PNPM) that provides incentives to communities which exceed certain preschool enrollment thresholds. However, although the government of Indonesia has improved preschool services for poor rural communities through these programs, the coverage is still limited (Hasan *et al.,* 2013). Therefore, preschool fees and other costs may constrain low income families from sending their children to preschool (Smart, Sanson, Baxter, Edwards, & Hayes, 2008). This situation results in unequal access to preschool: affluent families can afford to pay for preschool, while children from low-income families, especially in rural areas, are less likely to attend preschool (UNESCO, 2007). Therefore, while basic education participation in Indonesia is almost universal, and in spite of implementing these efforts, preschool enrollment is still low, with a gross enrollment rate of about 51 percent (World Bank, 2015).

3.3 Theory and hypotheses

Social stratification theory assumes that social background characteristics are pivotal for individual outcomes. These social background characteristics are summarized in the concept of socio-economic status (SES), which refers to income, educational attainment and occupational prestige (Duncan, Featherman, & Duncan, 1972). Generally, it is assumed that the higher the SES, the better will be individual outcomes, such as preschool participation. For instance, a household's income will affect its spending capacity, including financing children's (pre)school attendance (McNeal, 1999). Likewise, heads of households with higher levels of education are expected to have higher education-related expectations for their children (Davis-Kean, 2005).

Next to SES, other factors are also influential, such as access to mass media. The argument is that access to mass media spreads modern values (Delamaza, 2014), which in turn increase parents' educational aspirations. This, in turn, may make parents more eager to send their children to (pre)school (Galab, Vennam, Komanduri, Benny, & Georgiadis, 2013). Furthermore, living in an urban area facilitates access to social services (Johansone, 2010), including preschools. Hence, children's preschool enrollment depends on parents' decisions, which are influenced by parents' social and economic status (SES), along with urbanization and access to modern values via mass media.

In the last three decades, more and more scholars have emphasized the importance of social capital, since it affects a wide array of educational outcomes, ranging from enrollment, attendance, attainment and educational achievement (e.g. Fasang, Anette, Mangino, & Bruckner, 2011; Muller, 2001; Grootaert, 1999; Smith *et al.*, 1995). There is continuous debate about how to think about social capital and how to properly measure diverse conceptualizations of social capital (cf. Sobel, 2002; Arrow, 1999).

Until now, quite diverse interpretations exist about the exact meaning of social capital, but there seems to be a consensus that it enables individuals and groups to achieve their objectives. As stated by Adam Smith, humans tend to pursue the same general goals, namely physical welfare, social approval, and status (Flap & Volker, 2013). Social capital helps to fulfill these needs. For instance, Coleman's idea (1988) of social capital emphasizes the structure of relations that help create commitments between social actors to attain their goals. Woolcock (1998) describes social capital as an instrument for sharing information, trust and reciprocity via social networks. Others (e.g. Fukuyama, 1999; Putnam, 2000) emphasize the sharing of informal values and norms that enable members of a group to cooperate so as to increase their productivity. Based on these specifications, in our paper we define social capital as the structure of relations that facilitate individuals to share information, that strengthen norms of reciprocity, and that foster trust in institutions and other citizens (Beard, 2005). We thus distinguish three types of social capital: association, trust and reciprocity, which we expect to have a positive effect on children's preschool attendance.

Social capital resides in relations between individuals (Lin, 2001; Astone, Nathanson, Schoen, & Kim, 1999), both in families and communities (McLanahan & Sandefur, 1994; Coleman, 1990). In this paper, we take into account households and local communities as distinct levels of analysis. The concept of community social capital refers to communities of place (geography) and communities of interest (Flora, 1997). We define communities in the geographical way as people in a village who interact with others both within the village and between villages. To comprehend under which conditions social capital affects preschool participation, we study not only direct effects of social capital, but also within- and between-level interaction effects, in order to analyze whether social capital can compensate for other resources that determine school enrollment.

3.3.1 Socio-economic status (SES) factors

First of all, the economic household production theory suggests that income is the basic resource that parents invest in children (Becker, 1991). Household income is thus an important determinant of children's preschool participation: the higher a household's income and educational level, the higher the likelihood that children will attend preschool (e.g. Duncan *et al.*, 1972). Studies show that preschool participation is an effective way to enhance children's chances of success in developing countries (Engle, Black, Behrman, de

Mello, Gertler, & Kapiri, 2007), but public spending on preschools is low. Therefore, preschools rely mainly on fees and parental contributions that may prevent low-income families from sending their children to preschool (Smart *et al.*, 2008).

For example, parents with limited financial resources need to spend a larger portion of their income for their basic needs while parents with more money tend to spend more money on non-basic needs, such as children's education. This increases their children's probability of attending preschool. Consequently, children's access to preschool varies significantly depending on their family's income level (Cascio & Schanzenbach, 2014). In Indonesia, children from the lowest income quintiles were found to be less likely to enroll in preschool, with only 16 percent enrolling, whereas children of the richest quintile of the country had a 40 percent probability of enrolling in preschool in 2011 (Hasan *et al.*, 2013).

Second, as can be argued from human capital theory, highly educated parents strongly prefer to increase their children's education because they recognize its importance (Becker, 1993). This implies that the educational attainment of parents affects their decisions to send children to school (cf. Manski, Sandefur, McLanahan, & Powers, 1992). These parents will also appreciate the importance of preschool participation as a vehicle of school readiness (Smart *et al.*, 2008). They are aware that sending their children to preschool may increase their cognitive and social development and benefit their future school trajectory. In the case of Indonesia, the evidence indicates that lower-educated parents tend to do less well in many aspects related to their children's early development, including preschool enrollment (Hasan *et al.*, 2013). Based on these mechanisms, we regard the household's income and education as the household SES, which may be vital for choices regarding preschool.

In summary, if a family is wealthier and better educated the children are far more likely to enroll in preschool than are children from families that are less wealthy and educated. Consequently, we predict that *the higher the household socio-economic status (wealth and educational attainment) the more likely that children in that household will attend preschool (H1).*

At the community-level, household earnings could also be an important reason for parents' decisions to dwell in a well-off neighborhood that may affect educational resources, such as access to (pre)school (Klein, 2011). Likewise, a higher average wealth of a community results in more resources in the community. Such resources stimulate people to increase their aspirations, also regarding preschool participation. As already mentioned, most preschools are privately managed and funded, based on school fees paid by the parents. Besides the preschool fee, preschools also receive contributions from their communities. Moreover, although many preschool teachers work voluntarily (Hasan *et al.*, 2013), preschools still need financial support for initial investments in buildings, infrastructures and operations. This implies that affluent communities have more opportunities to establish preschools, which may increase a child's chance of attending

preschool. Therefore, we predict that *living in a wealthier community increases children's likelihood of attending preschool (H2).*

3.3.2 Modernization and urbanization

Modernization is the permanent continuation of the process that transforms societies from agricultural dominance to domination by trade and industry (Charlton & Andras, 2003). Modern societies are based upon growth and the expectation of growth. This includes economic growth but also cognitive growth, which means an increase in knowledge and aspirations, including (the value and importance of) children's education. One important element of modernity is the emergence and pervasiveness of the media (e.g. Fleras, 1994; Hoover, 1993), including government policies to increase access to radio and television, also in remote areas, in order to increase (ideological) unity and government influence (power) in the periphery (Gazali, d'Haenens, Hollander, Menayang, & Hidayat, 2003). Access to mass media contributes to modern cultural integration, which can also increase participation in education (Delamaza, 2014).

The media may influence parents' perception and valuation of preschool enrollment and lead to the creation of a social norm (Perkins & Berkowitz, 1986) that it is good to send children to preschool. When parents' preschool awareness increases in the central region of the country, the media then spread this awareness to the periphery as part of cultural integration. As a result, household access to media is expected to increase parents' likelihood of enrolling their children in preschool.

Furthermore, mass media serve to connect people at local levels to the global level and thereby help to enhance awareness and advance diffusion of new ideas (c.f. Servaes, 2008; McLuhan, 1964). This diffusion of modern values, such as eagerness to send children to preschool, may boost other parents' understanding of the importance of preschool participation. Therefore, living in a village with a high media access may influence a household's knowledge and aspirations, in turn increasing the household's eagerness to send their children to preschool. We therefore expect that *the greater the household and community access to mass media, the greater the chance that children will attend preschool (H3).*

Like mass media, urbanization is also related to social and cultural changes in community life. Because the infrastructures in urban areas are generally better than in rural areas, access to communication via technology also tends to be better. These indirect and direct forms of communication can augment the flow of ideas and knowledge (Lucas, 2004). Another factor, urban transportation facilities, also enhances access to direct interaction among inhabitants (Johansson, Hasselberg, & Laflamme, 2010). Moreover, better transportation can solve the distance from homes to preschool locations, making it easier for parents to send their children to preschool even at a young age. Furthermore, the dense population of urban areas results in increased economies of scale. This in turn helps both government and communities to create public services (Buchmann &

Brakewood, 2000), including preschools. All these advantages of living in an urban area may therefore improve children's access to preschool. We therefore expect that *residing in urban communities is associated with an increased probability of children attending preschool (H4).*

3.3.3 Social capital

Social capital in terms of informal networks is ubiquitous in Indonesian society. Besides community organizations sponsored by the government, such as neighborhood associations (*Rukun Tetangga/RT* and *Rukun Warga*/RW), state-led co-operations and community credit groups (*Koperasi Unit Desa/*KUD), other community-based organizations are abundant, such as informal rotating savings groups, traditional arts groups, sports groups, youth groups, farmers' groups, fishermen's groups and religious institutions (Miguel, Gertler, & Levine, 2006).

Theoretically, the benefits of social capital for preschool participation may flow to the household and community as follows. First, social capital facilitates information sharing, thereby advancing social interactions among household and community members. Social interaction enables individuals to learn about the behavior of others and may lead to imitation (Collier, 2002). Second, social capital can complement or take the place of legal mechanisms that provide financial support (Knack, 2002). For instance, people use money acquired from informal rotating savings groups, like *Arisan*, to handle emergency needs (Anggraeni, 2009) such as children's education. These informal financial support mechanisms can, if accessed, increase parents' likelihood of sending their children to preschool. Third, social capital enables individuals and groups to access other valued resources (Bourdieu, 1993). For instance, interaction between individuals may strengthen cohesion in the community, in turn generating collective action to acquire more educational resources, like preschool subsidies and block grants, to improve access to early education.

The social influence theory states that people adopt the behaviors of those they interact with (Friedkin, 1998). Involvement in community activities or engaging in an association facilitates interaction, enabling individuals to adopt new behaviors or adapt existing behaviors and aspirations. Social interaction also leads to deeper relationships, thus generating cohesiveness and trustworthiness and consequently reciprocity. In the case of preschool participation, parents may compare their own vision to that of others when deciding whether or not to send their children to preschool. If one household is eager to send their children to preschool, this may transmit knowledge and a perception of the importance of preschool, as well as status motivation; these are the result of group associations and other informal networks. Such knowledge and opinion transmission processes may affect other households, implying copying behavior (Collier, 2002).

Household involvement in group associations is thus a form of social capital that can facilitate the diffusion of information and may result in a household's adopting behavior such as sending their children to preschool. Moreover, social capital provides access to financial or other resources that may help parents to send their children to preschool. For example, regardless of family income, access to financial or other assistance in an emergency has shown to be related to school attendance (Hofferth, Boisjoly, & Duncan, 1998). Based on these arguments, we maintain that *the higher the household's social capital, the higher the children's likelihood of enrolling in preschool (H5).*

Given that social capital is important for information diffusion, as argued above, social capital may also positively affect the diffusion of educational information within a community (Rogers, 1995). Living in communities with dense networks and associations, and high levels of trust and reciprocity, may accelerate diffusion of knowledge and innovation; this in turn can affect the level of educational promotion and psychosocial support (Stansfeld, 2006). Therefore, community social capital might increase parents' educational aspirations, which in turn can be expected to increase their probability of enrolling their children in preschool.

Community social capital may also generate cooperation at the community level, enabling members to work together in providing collective goods, such as rotating savings or credit associations (Collier, 2002). Free riding and opportunistic behavior are prevented by means of social sanctions enforced by the community. Such public goods enable parents to handle times of economic hardship by asking the community to help them send their children to preschool. In case parents need money for an emergency, such as the preschool registration fee, cooperative norms at the community level can help parents with lack of access to bank credit by providing solidarity, risk pooling and financial protection (Mladovsky, 2014).

Community social capital is also related to potential political strength, which can help attract educational resources to those communities (Van Damme & Miyamoto, 2010). Community social capital also enables community members to enforce norms supporting joint production that facilitates collective decision making (Collier, 2002). Collective decision making enables groups to improve their bargaining position *vis-a-vis* the government if they are trying to establish a preschool in their community. The ability to bring resources to the community and the capacity to take part in managing their preschool facilities may attract parents to enroll their children in preschool. Consequently, we predict that *the higher the community's social capital, the higher the probability of its children enrolling in preschool (H6).*

3.3.4 The moderating role of social capital: compensating effects

Social capital explanations have, however, rarely considered possible moderating effects. We identified one study on adults that identified an interaction between SES and social capital on health (e.g. Song, 2009). For clarity we distinguish here between the complementing and compensating effects of social capital. Complementing effects are the cumulative effects of household and community social capital: each strengthens the other's effect, leading to a larger joint effect of social capital and thereby households that are better off (Song & Lin, 2009). Compensation effects are present when, for example, low-income households compensate for a lack of financial resources by means of social capital (Mladovsky, 2014).

We assume that social capital can compensate for other resources; if compensation works, low income and less educated households would rely more on social support and networks to meet the challenges of daily life, such as their children's education. For instance, low-income households may have fewer resources to invest but they can invest more time (Grootaert & Bastelaer, 2002). Conversely, heads of households with a higher income and education are more able to find and understand information by themselves, and may thus make less use of social capital less than their low-income and -education counterparts. Therefore, we expect *that a household's social capital compensates for the negative impact of (a) low income, (b) low educational attainment, and (c) limited access to media on preschool attendance (H7).*

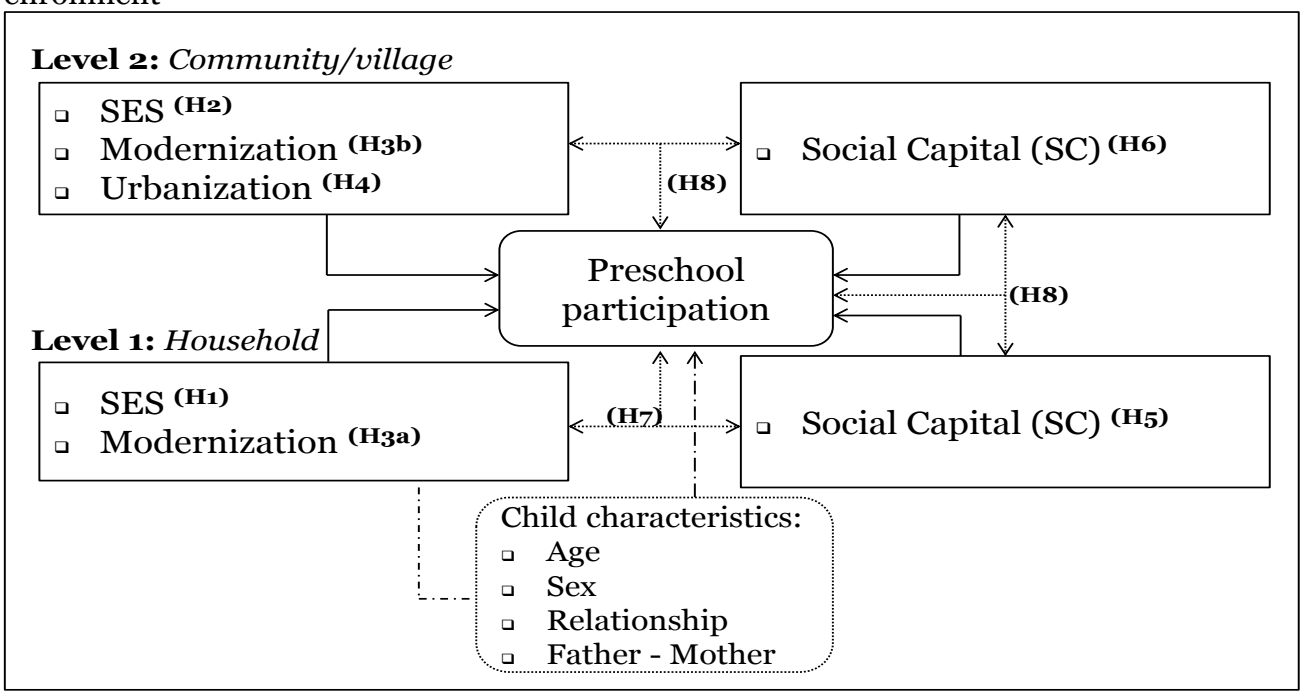
We expect that the above factors may play a role in all circumstances, but that the features of the community context, such as average income, urbanization and access to mass media may also determine their level of importance. For example, in rural areas some dimensions of social capital may affect whether low-income households send their children to preschool because people in rural areas tend to be more linked to their geographical context, such as neighborhood associations. Another example is that parents' awareness of the value of preschool may also be influenced by mass media as an important source of information. Currently, the mass media play a crucial role in forming public opinion (Lindsey, 1994). Moreover, both print and electronic media are used to promote preschool as part of government programs. For instance, UNICEF findings (2006) indicate that several developing countries utilize radio and television to produce developmentally, culturally appropriate, and practical programs for and about early child development (ECD), in line with the spirit of ECD campaigns. As, for example, in the Maldives, such endeavors are directly linked to parents' change in attitude and behavior regarding ECD (UNICEF, 2004).

To take this contextualization into account, we also consider cross-level interaction effects (Snijders & Bosker, 2012). For instance, we examine a household's association with the average associations and reciprocity at the village-level, as well as with the degree of urbanization. Based on the social influence theory, we predict that living in communities with higher association and reciprocity may strengthen the effect of a

household's preschool participation (Friedkin, 1998). In addition, we assume that preschool enrollment may be lower in the countryside because rural areas have a general lack of preschools, as well as an inadequate infrastructure, which makes it more difficult for parents to send young children to preschool (Temple, 2008). On the other hand, households living in rural areas might have more time, which may increase their opportunity to accelerate collective action (Matta & Alavalapati, 2006). This collective action may empower households and communities to deal with government policy, including accessibility of preschools. Consequently, we predict that *community social capital compensates for the negative effects of household and community factors on preschool participation (H8).*

Figure 3.1 summarizes our conceptual framework.

Figure 3.1 Theoretical framework of the influence of social capital on preschool enrollment



3.4 Data and method

3.4.1 Data collection

To find an answer to our research question, we utilize representative individual and household datasets from the national socio-economic survey (Susenas 2009). The Susenas is a representative survey conducted by Statistics Indonesia to gather basic social and economic information (the Core) from 1,155,566 individuals in 291,753 households with reference to eight indices: demography, health, education, labor, fertility and family planning, housing and consumption. The respondents are heads of households or other household members. In addition, the Susenas includes more detailed information on special interest topics, including social capital indices of 291,753 households (the Module). Both the Susenas Core and Module are conducted annually in July (Central Bureau of Statistics/CBS, 2009).

Based on these datasets, we construct variables from individual and household data. Then, to construct contextual variables at the community level, we aggregate the representative household data to the village level, using weights to ensure the representativeness of the CBS household population. We selected children aged 4-6 years, since this is the official preschool age (N=70,263). As the majority of 6 year olds (86.4%) were already enrolled in primary school, we focused on 4 and 5 year old children (N=46,525). To simplify the analysis, we omitted the children of these ages who already attended primary school. This reduced the sample by about 6 percent to 43,879 children in the age group of 4 to 5 years, nested in 42,855 households in 14,774 villages.

3.4.2 Data description

The variables are described by the level at which they are measured (child, household, village). Summary statistics are presented in Tables 3.1a, 3.1b and 3.1c.

Child

Preschool participation. Indicator of preschool attendance (0=no; 1=yes).

Gender. Indicator of gender (0=boy; 1=girl).

Age. Indicator of child's age (0=4 years; 1=5 years).

Relationship to head of household. Indicator of head of household's relationship (0=non-child; 1=child).

Paternal orphan. This means that the child's biological father is deceased or missing (0=no; 1=yes).

Maternal orphan. This means that the child's biological mother is deceased or missing (0=no; 1=yes).

Table 3.1a Child-level variables and preschool participation (N=43,879)

Variables		Total (%)	Attended preschool (%)
Relationship			
	Non-child	13.0	36.0
	Child	87.0	30.1
Gender			
	Boy	51.9	29.6
	Girl	48.1	32.2
Age			
	4 years	54.0	22.9
	5 years	46.0	40.2
Paternal orphan			
	No	92.8	30.7
	Yes	7.2	33.3
Maternal orphan			
	No	95.7	30.9
	Yes	4.3	30.7

Household

Wealth. Household expenditure per capita adjusted by the poverty line of each municipality and classified in five quintiles (20 percent), the lowest being "1", low "2", medium "3", high "4" and highest "5".

Head of household's education. Four categories are distinguished: (1) below primary (21.7%), (2) completed primary (30.8%), (3) completed junior secondary (17.1%), and (4) senior secondary and higher (30.4%).

Access to mass media. Indicator of access to media (0=no access; 1=having at least access to print or electronic media, such as books, magazines, radio, television and newspapers).

Dimensions of Social Capital

Associations. Sum score of the number of groups for social and community activities that the head of the household is involved in.

Trust. Mean score of three questions on whether respondents entrust the financial management to the: (1) neighborhood administration, (2) management of the community

group, and (3) village office/head; with six alternatives: (0 'do not know', 1 'do not care', 2' not confident', 3 'less confident', 4 'confident', and 5 'very confident').

Reciprocity. Mean of two questions, one on ease of borrowing money from the neighborhood for emergency needs such as for school, the other on readiness to lend money to a neighbor for emergency needs such as for school. Both questions are coded from 0 to 5, with 0 standing for 'do not know', 1 for 'very difficult', 2 for 'difficult', 3 for 'rather difficult', 4 for 'easy' and 5 for 'very easy'.

Table 3.1b Household-level variables and preschool participation (N=42,855)

Variables		Total	Attended preschool (%)		
Education	**Wealth**		**No access**	**Access media**	**Overall**
Below primary (21.7%)					
	Lowest	33.8	9.8	19.3	15.7
	Low	24.4	14.2	23.5	21.4
	Medium	19.6	14.5	24.5	22.7
	High	14.8	15.7	28.5	27.0
	Highest	7.3	9.9	31.6	29.3
Primary school (30.8%)					
	Lowest	24.1	11.9	22.9	20.3
	Low	24.4	16.5	25.7	24.3
	Medium	22.0	17.6	29.3	28.1
	High	18.7	16.3	31.8	30.5
	Highest	10.8	21.7	38.0	37.1
Junior secondary					
	Lowest	17.2	13.2	24.3	21.9
	Low	20.2	15.1	27.8	26.3
	Medium	22.6	13.4	32.2	30.8
	High	22.9	18.2	34.9	34.0
	Highest	17.0	37.9	41.5	41.4
Senior high school or					
	Lowest	7.7	13.6	24.1	22.5
	Low	12.3	18.9	32.5	31.4
	Medium	16.7	17.0	35.3	34.6
	High	23.4	27.0	43.0	42.6
	Highest	39.9	31.7	53.8	53.6
Total (100%)					
	Lowest	20.0	11.1	22.2	19.1
	Low	20.0	15.7	26.9	25.2
	Medium	20.0	15.7	30.6	29.1
	High	20.0	17.9	36.1	34.9
	Highest	20.0	21.9	47.8	47.1

Table 3.1b shows that there are clear patterns in the relation between household education, income, access to mass media and preschool attendance. If the education level and income of the head of the household are high and he or she has access to mass media, preschool participation tends to consistently increase.

The relations between household education, income, access to mass media and household social capital have different patterns. Table 3.1c reveals that when the education level and income of the head of a household are high, as well as his/her access to mass media, this tends to slightly increase his/her associations.

Table 3.1c Household-level variables and social capital (N=42,855)

Variables		Mean of		
Education background	**Wealth**	**Association**	**Trust**	**Reciprocity**
Below primary (21.7%)				
	Lowest	1.24	3.55	2.87
	Low	1.35	3.56	2.98
	Medium	1.38	3.55	3.07
	High	1.39	3.52	3.07
	Highest	1.39	3.44	3.08
Primary school (30.8%)				
	Lowest	1.43	3.56	2.92
	Low	1.50	3.57	3.05
	Medium	1.56	3.59	3.04
	High	1.54	3.54	3.09
	Highest	1.61	3.49	3.09
Junior secondary (17.1%)				
	Lowest	1.45	3.53	2.98
	Low	1.51	3.53	2.99
	Medium	1.59	3.55	3.04
	High	1.59	3.48	3.02
	Highest	1.60	3.46	3.00
Senior high school/higher (30.4%)				
	Lowest	1.49	3.47	2.94
	Low	1.59	3.50	3.01
	Medium	1.66	3.49	2.96
	High	1.69	3.50	2.95
	Highest	1.76	3.42	2.81
Access to mass-media				
	No	1.23	3.51	2.83
	Yes	1.58	3.52	3.00

Meanwhile, household trust remains level to off and tends to decrease by increased household income. Likewise, a higher household income in combination with a primary and lower than primary educational background increases household reciprocity but this reciprocity tends to decrease for a head of household with a senior high school or higher educational background.

We construct village-level social capital dimensions by aggregating the full sample of household-level social capital. Table 3.2a shows means and correlations of the three social capital dimensions and access to mass media at the household-level, as well as average income (wealth), social capital dimensions and access to mass media at the village-level.

In Table 3.2a, the means at the household and village levels are almost similar. Moreover, reciprocity at the village level are greater than those at the household level. On the other hand, correlations between association and access to mass media at the village level are smaller than correlations at the household level. This means that the effects of community trust are stronger than those of household trust for community association and reciprocity. On the other hand, the effect of a head of household's access to mass media explains more with regard to household associations than does community access to mass media.

Table 3.2a Mean, standard deviation, correlations of household & village-level variables

Variables	Household level		Village level		1	2	3	4
	Mean	Std.	Mean	Std.	Village level (N=14,774)			
Household level (N=42,855)								
1. Association	1.53	0.94	1.63	0.90		.112**	.122**	.076**
2. Trust	3.52	0.92	3.54	0.51	.099**		.263**	-.001
3. Reciprocity	2.98	1.11	2.97	0.67	.125**	.151**		.053**
4. Access to mass media	0.88	0.33	0.87	0.19	.122**	0.004	.050**	

Notes:
- *Village-level variables are computed by averaging household variables.*
- *Correlations above the diagonal are at village-level and below at household-level.*
- ** P<0.05; ** P<0.01 (2-tailed).*

Community/village

Average wealth. Logarithm of average household expenditure per capita adjusted by municipality poverty.

Access to mass media. Mean percentage of households having access to mass media.

Urbanization. Indicator variable based on CBS classification at the community level (0 = rural area; 1 = urban area).

Table 3.2b Mean, standard deviation and correlations between village-level variables in rural and urban villages (N=14,774)

Village	(N=4,547)		(N=10,227)						
	Mean	**Std.**	**Mean**	**Std.**	**1**	**2**	**3**	**4**	**5**
1. Average household wealth (log)	6.02	0.15	5.88	0.13		.046**	-.047**	.070**	**.350****
2. Association	1.60	0.76	1.64	0.96	-.057**		**.087****	**.101****	.090**
3. Trust	3.42	0.54	3.60	0.49	-.150**	**.176****		**.215****	.072**
4. Reciprocity	2.75	0.66	3.07	0.65	-.197**	**.177****	**.282****		.171**
5. Access to mass-media (%)	0.96	0.07	0.83	0.21	**.256****	.089**	-.049**	-.091**	

Notes:
- *Village-level variables are computed by averaging household variables.*
- *Correlations above the diagonal are for rural villages and below for urban villages.*
- ** P<0.05; ** P<0.01 (2-tailed).*

Table 3.2b shows that average income and access to mass media are higher in urban villages than in the countryside. However, means of association, trust and reciprocity are higher in rural villages than in urban areas.

3.4.3 Analytical procedure

We use multilevel logistic regression analyses (see *e.g*. Snijders & Bosker, 2012; Hox, 2010) to test each of the hypotheses related to the research question. Multilevel analysis allows us to take into account the hierarchical nature of our data, with children belonging to households and households grouped into villages, and to test the effect of child, household and village level variables on preschool enrollment.

A sequence of models is estimated, using a forward selection strategy, starting with adding the child-level characteristics to the so-called null or empty model (without explanatory variables, except for intercept and variances at household and village levels). This is followed by household-level variables: wealth, education and access to mass media. In the next model the household social capital measures are added to test the contribution of these central variables to our research question. In the fourth step the contextual effects of wealth, access to mass media, urbanization and social capital at the

village level are added. Finally, to examine whether model parameters are constant across household and community and to test hypotheses 7 and 8, we add within-level and cross-level interactions and retain the significant effects. The resulting model is presented as the final model.

All models were initially estimated using *Iterative generalized least squares* (IGLS) and *Markov chain Monte Carlo* (MCMC) estimation with burn-in length 20,000 and chain length 50,000, with the final model rerun having 50,000 burn-in and 100,000 chain iterations. We also employed both orthogonal parameterization and hierarchical centering to reduce the amount of autocorrelation (Browne, Charlton, Kelly, & Pillinger, 2014; Snijders & Bosker, 2012).

The regression parameters of all models are presented on the logit scale in the tables. They are interpreted as relative increase in the odds of preschool enrollment for a child given his/her characteristics and the characteristics of the household and village s/he lives in. The odd is the ratio of the probability of preschool enrollment over 1 minus this probability (the probability of non-enrollment). Note that an increase in odds implies an increase in probability[5].

3.5 Results

We started the analysis with the estimation of a null model (Model Null in Table 3.3) with intercept variances at the household and village levels. From the null model, the estimated average probability of preschool enrollment is equal to 0.24. The household variance is quite low whereas the village variance is large, implying a wide range of village preschool participation probabilities, estimated to be in the (0.01; 0.89) interval, and by contrast a very small range of household preschool probabilities (0.23; 0.25), for an average village.

Children's characteristics are added in a first step. Model 1 in Table 3.3 shows that 5 year olds, girls, or children who live in households whose head is not their biological father have significant relatively increased odds of going to preschool, by 247, 18, and 33 percent respectively. On the other hand, being a maternal orphan significantly diminishes the odds that children will enroll in preschool, by a relative 24 percent.

[5] The relative increase is based on the odds factor, defined as exp(b), where b is a regression coefficient, leading to the expression for relative increase in odds factor equal to (exp(b)-1)*100 (*see, e.g.* Pampel, 2000).

Table 3.3 Multilevel logistic regression models of child preschool participation

Preschool participation	Model Null		Model 1		Model 2	
	Est. (β)	S.E.	Est. (β)	S.E.	Est. (β)	S.E.
Fixed Part						
Intercepts	-1.131	0.022	-1.886	0.034	-3.689	0.074
Child-level characteristics (N=43,879)						
Relation (1= not biological)			0.288 ***	0.047	0.553 ***	0.048
Gender (1= girl)			0.169 ***	0.029	0.174 ***	0.029
Age (1= 5 years)			1.244 ***	0.031	1.302 ***	0.031
Paternal orphan: Yes (1) vs No (0)			0.049	0.066	0.162 *	0.067
Maternal orphan: Yes (1) vs No (0)			-0.277 **	0.084	-0.332 ***	0.084
Household-level variables (N=42,855)						
Wealth quintiles: *Lowest (ref.)*						
Low					0.321 ***	0.050
Medium					0.530 ***	0.051
High					0.817 ***	0.052
Highest					1.318 ***	0.055
Head of household's education: *Below primary (ref.)*						
Primary school					0.273 ***	0.045
Junior secondary					0.478 ***	0.051
Senior high school or higher					0.843 ***	0.048
Acces to mass-media					0.781 ***	0.057
Random Part						
Village-level variance	2.784	0.100	3.158	0.115	2.637	0.100
Household-level variance	0.001	0.001	0.002	0.001	0.001	0.000
*-2*loglikelihood:*						
DIC:	47,082		44,893		43,552	
pD:	7,296		7,422		6,780	

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001.*

Taking into account the household's SES and access to mass media, Model 2 in Table 3.3 reveals that a household's income and level of educational attainment significantly increase the odds of children's attending preschool as expected: the higher the education and the higher the income, the greater the (relative increase in) odds of preschool attendance. These results therefore fully support the first hypothesis that the likelihood of preschool attendance increases with the household's income and educational attainment (SES).

After including the household's SES, the regression coefficients of the child-level characteristics slightly change but the directions and significances remain stable, except for the coefficient of paternal orphan, indicating a small relative increase in odds of 18 percent. The results remain similar in terms of directions after taking into account the household's social capital (Model 3) and after including village-level variables, such as average income, access to mass media, urbanization and social capital (Model 4).

Table 3.4 Multilevel logistic regression models of preschool participation with interactions

Preschool participation	Model 3		Model 4		Model 5 continued	
	Est. (β)	S.E.	Est. (β)	S.E.	Est. (β)	S.E.
Fixed Part						
Intercepts	-3.611	0.074	-3.260	0.081	-3.269	0.081
Child-level characteristics (N=43,879)						
Relation	0.530 ***	0.048	0.442 ***	0.048	0.438 ***	0.048
Gender	0.173 ***	0.029	0.170 ***	0.029	0.170 ***	0.029
Age	1.304 ***	0.031	1.311 ***	0.031	1.311 ***	0.031
Paternal orphan: Yes (1) vs No (0)	0.182 **	0.067	0.184 **	0.067	0.187 **	0.067
Maternal orphan: Yes (1) vs No (0	-0.329 ***	0.084	-0.292 ***	0.085	-0.290 ***	0.085
Household-level variables (N=42,855)						
Wealth quintiles: *Lowest (ref.)*						
Low	0.311 ***	0.050	0.245 ***	0.051	0.246 ***	0.051
Medium	0.511 ***	0.051	0.405 ***	0.052	0.408 ***	0.052
High	0.794 ***	0.052	0.651 ***	0.054	0.658 ***	0.054
Highest	1.280 ***	0.055	1.088 ***	0.059	1.093 ***	0.059
Head of household's education: *Below primary (ref.)*						
Primary school	0.250 ***	0.045	0.201 ***	0.045	0.199 ***	0.045
Junior secondary	0.452 ***	0.051	0.356 ***	0.051	0.355 ***	0.051
Senior high school or higher	0.798 ***	0.048	0.638 ***	0.049	0.626 ***	0.049
Acces to mass-media	0.739 ***	0.058	0.282 ***	0.063	0.279 ***	0.062
Social capital dimensions						
Group association	0.171 ***	0.017	0.172 ***	0.020	0.171 ***	0.020
Trust	-0.024	0.017	-0.025	0.018	-0.019	0.038
Reciprocity	0.004	0.014	0.012	0.016	0.104 **	0.036
Village-level variables *(N=14,774)*						
Mean household wealth (log)			0.080	0.164	0.031	0.163
Access to mass-media (%)			2.085 ***	0.148	2.057 ***	0.145
Urbanization (1=urban, 0=rural)			0.642 ***	0.049	0.616 ***	0.049
Social capital dimensions						
[Community] Association			0.028	0.026	-0.026	0.030
[Community] Trust			0.083	0.044	0.082	0.045
[Community] Reciprocity			0.075 *	0.036	0.153 ***	0.043
Random Part						
Village-level variance	2.608	0.101	2.518	0.099	2.505	0.100
Household-level variance	0.001	0.000	0.002	0.001	0.001	0.000
*-2*loglikelihood:*						
DIC:	43,495		43,018		42,989	
pD:	6,743.9		6,542.3		6,523.8	

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001.*

The second hypothesis predicted that living in wealthier communities would increase children's likelihood of attending preschool. The data show that residing in a more upscale community is not significantly associated with a higher chance of children attending preschool. Therefore, after taking into account household wealth, no evidence is found for an additional effect of community wealth.

The third set of hypotheses suggested that children from households with access to mass media and in a community with higher access to mass media are more likely to attend preschool. After controlling for SES, the results of Model 4 in Table 3.4 lend support to this set of hypotheses. Media access leads to a relative increase in odds, of 33 percent. Next, living in a community with higher access to media significantly increases children's odds of enrolling in preschool by more than seven times. Consequently, these results are in line with our expectations.

Hypothesis 4 predicted that residing in urban communities is associated with an increase in children's probability of attending preschool. Results show that residing in urbanized communities significantly increases the odds of children's chances of enrolling in preschool, by 90 percent. This result is fully in line with our hypothesis.

Now we turn to the central hypotheses on social capital. The fifth set of hypotheses predicted that the higher the household's social capital, the higher the likelihood that children will attend preschool. Results in Model 4 in Table 3.4 show that the higher the degree of household associations, the higher the children's odds of attending preschool (a significant relative increase in odds of 19 percent). On the other hand, a household's trust and reciprocity do not significantly affect children's probability of attending preschool. Our findings thus only partly support the hypothesis that household social capital increases preschool enrollment: of the three social capital indicators, only the degree of associations was found to have an effect.

The sixth hypothesis postulated a positive relationship between community social capital and preschool enrollment. Model 4 in Table 3.4 shows that residing in communities with higher reciprocity significantly increases children's odds of attending preschool by 8 percent. Meanwhile, living in higher community association and trust are not found to affect the likelihood of children attending preschool. Consequently, the results lend partial support to H6.

To gain more insight into what these analyses mean in terms of probabilities, we now turn to 'scenarios' of preschool participation in which the probability of preschool attendance is calculated for a child with a set of characteristics (at all levels). As the best scenario for the effect of SES on a low SES household, Table 3.5 shows 48 scenarios of the 'best-off' (i.e. with highest probability) and 'worst-off' (lowest probability) of children and households in urban and rural villages in Table 3.5.

Table 3.5 Scenarios of child preschool participation (based on model 4)

Child-level	Village level				Village level				
	Urban	Urban + reciprocity	Rural	Rural + reciprocity		Urban	Urban + reciprocity	Rural	Rural + reciprocity
Best-off: *Non-child, girl, 5 years, child with both biological parents*									
A1	0.79	0.80	0.66	0.68	**B1**	0.33	0.35	0.21	0.22
A2	0.51	0.53	0.35	0.37	**B2**	0.44	0.46	0.29	0.31
A3	0.82	0.83	0.70	0.71	**B3**	0.37	0.39	0.24	0.25
Worse-off: *Child, boy, 4 years, not living with biological mother*									
C1	0.29	0.30	0.18	0.19	**D1**	0.05	0.05	0.03	0.03
C2	0.10	0.11	0.06	0.06	**D2**	0.08	0.08	0.04	0.05
C3	0.33	0.34	0.20	0.21	**D3**	0.06	0.07	0.03	0.04

Notes:

1) Opposite in head of household's education and income
   - A1 & C1 = Head's household with the highest income, senior high school or higher education and access to mass-media.
   - A2 & C2 = Head's household with low income, primary education and access to mass-media.
2) Opposite in head of household's education and income adding with associations
   - A3 & C3 = Head's household with the highest income, senior high school/higher education, access to mass-media and higher association (above mean).
   - B1 & D1 = Head's household with the lowest income, below primary senior high school or higher education and no access to mass-media.
3) Low vs lowest income and primary vs below education by adding with associations
   - B2 & D2 = Head's household with the low income, primary education background and no access to mass-media.
   - B3 & D3 = Head's household with the lowest income, below primary education, no access to mass-media and higher association (above mean).

Based on these scenarios, household SES and access to mass media are important determinants of children's probability of attending preschool, as indicated in comparisons between values of quadrants A-C and quadrants B-D. Moreover, children's individual characteristics: gender, age, and parental status, are factors contributing vitally to children's probability of attending preschool; this is shown in the difference between percentages of quadrants A-B and C-D. Likewise, living in urban villages increases the probability of children attending preschool, with a minor effect of village reciprocity.

Interaction effects

We assume that the relations between social capital dimensions (association, trust and reciprocity norms) and preschool participation depend on other household and community-level characteristics. The seventh set of hypotheses stated that household social capital compensates for the negative impact on preschool attendance of: (a) low income, (b) low educational attainment, and (c) limited access to media.

Table 4 shows that with the exception of household reciprocity (which has a small positive effect with a relative increase in odds of 11 percent), there are no substantial differences between Model 4 in Table 3.4 and Model 5 in Table 3.6 with interaction effects for SES, media access and urbanization. Likewise, at the community level, the size of the reciprocity effect considerably increases.

Table 3.6 Multilevel logistic regression with interaction effects

Preschool participation	**Model 5** continued	
	Est. (β)	**S.E.**
Household-level interaction effects		
Trust * head of household's education		
[Trust *] Primary school	0.004	0.047
[Trust *] Junior secondary	0.109 *	0.053
[Trust *] Senior high school or higher	-0.065	0.045
Reciprocity * wealth		
[Reciprocity *] Low	-0.088	0.047
[Reciprocity *] Medium	-0.082	0.046
[Reciprocity *] High	-0.076	0.045
[Reciprocity *] Highest	-0.163 ***	0.044
Cross-level Interaction effects		
Association * Trust	0.077 *	0.034
Village-level Interaction effects		
Association * Urbanization	0.227 ***	0.056
Reciprocity * Urbanization	-0.248 ***	0.067

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001.*

Model 5 in Table 3.6 also shows that household reciprocity significantly reduces the effect of low household wealth on the probability of children enrolling in preschool. The results imply that, to some extent, reciprocity is able to compensate for a lack of financial resources, which partially supports our expectation. Reciprocity as a dimension of social capital increases the likelihood that the poorest households will send their children to

preschool. In addition, a higher group association rate at the household level strengthens the effect of community trust on children's chances of enrolling. These interaction effects, although not large, partially support the seventh hypothesis.

The final hypothesis expressed the expectation that the characteristics of community social capital compensate for the negative effects of other household and community factors on preschool participation. Model 5 in Table 3.6 shows that reciprocity has a higher effect in rural areas than in urban areas on children's odds of enrolling in preschool. On the other hand, living in a community with more associations significantly increases the effect of urbanization on these odds.

Even though there is no effect of community trust, these findings indicate that community reciprocity is able to compensate for children living in rural villages, which partially supports our expectation that community social capital can compensate for the effect of negative household and community factors on preschool participation.

Based on computations on Model 5, we compare the most contrasting cases as reflected in scenario A3 (the best possible scenario) and D1 (the worst possible scenario) for further clarification in Table 3.5. Scenario A3 in Table 3.5 shows that the probability of preschool attendance is highest (83%) for children, who:

- ☞ have a position in a household as a non-child (mostly grandchildren), are girls, 5 years old and not orphans;
- ☞ come from households with the highest household incomes, parents who graduated at least from senior high school, access to mass media, and high association membership;
- ☞ come from a community in an urban area and with strong reciprocity.

On the other hand, scenario D1 in Table 3.5 shows that the probability of preschool attendance is lowest (a striking 3% only) for children who:

- ⇨ have a position as a child of the head of household, are boys, 4 years old, and are maternal orphans;
- ⇨ come from households with the lowest income, with parents lacking a primary education background, and with no access to mass media
- ⇨ come from a community in a rural area.

Furthermore, reciprocity has an impact on children's probability of attending preschool. As can be seen from the comparison of scenarios in Table 3.5, the probability of attending preschool is 33 percent in scenario B1 for children who are non-child, girl, 5 years and not orphan, who however originate from a household with the lowest income, parents with a below primary education background and no access to mass media, low household association and weak reciprocity. In scenario B3 this probability is 39 percent for children who have similar individual and household characteristics, but who come from a family with a higher household association and live in a village with stronger reciprocity.

A summary of the results of those eight hypotheses is provided below in Table 3.7.

Table 3.7 Overview of the hypotheses and findings of our analyses

No.	Hypotheses	Results
1	The higher the household socio-economic status (wealth and educational attainment) the more likely that children in that household will attend preschool (H1).	√
2	Living in a wealthier community increases children's likelihood of attending preschool (H2).	**X**
3	The greater the household access to mass media and the higher the community access to media, the more likely that children in that household will attend preschool (H3).	√
4	Residing in urban communities is associated with an increased probability of children attending preschool (H4).	√
5	The higher the household's social capital, the higher the likelihood of children attending preschool (H5).	√
6	The higher the community's social capital, the higher the probability of children enrolling in preschool (H6).	√
7	Household social capital compensates for negative impact of (a) low income, (b) low educational attainment, and (c) limited access to media on preschool attendance (H7).	√
8	The characteristics of community social capital compensate for negative effect of household and community factors on preschool participation. (H8).	√

Notes:
√ = The findings are in line with the hypothesis.
X = The hypothesis is rejected by the findings.

3.6 Discussion and conclusion

In this paper, we sought to answer the question to what extent and under which conditions variations in preschool participation can be explained by differences in household- and community-level factors -- such as SES, modernization and urbanization – and how these factors may be moderated by social capital. Using a multilevel approach, we found that preschool participation is lower for children from low-SES backgrounds, having no access to mass media, and living in rural communities. Our results revealed that, compared to other explanatory variables, the effects of SES and access to mass media are stronger, indicating that social stratification is prominently linked to preschool participation in Indonesia; this is in line with previous findings (Lustig, 2015).

Furthermore, both household associations and living in a community with high reciprocity significantly increase preschool participation. In line with our expectation, social capital to some extent compensates for the negative effect of other factors: household reciprocity compensates for the effect of a low household income and community reciprocity compensates for the negative effect of living in a rural community. Thus, children from the lowest income households, but with higher social capital and living in a community rich in social capital, show attendance rates comparable to those of better-off households with lower social capital. People use the reciprocity of social capital when they need it, i.e. when they lack financial resources. These findings support the theory that social capital is related to instrumental goals that can compensate for a lack of resources, thereby augmenting the social capital literature (Flap & Volker, 2013).

Four unexpected findings deserve further discussion. *First*, residing in a better-off community is not significantly associated with a higher chance of children attending preschool. Perhaps this is a kind of compositional effect and related to the location where one lives, i.e. in an urban or rural area. When excluding the urban variable in our model, the effect of average income becomes positively significant (*not presented; available upon request*). The higher population density in urban areas is associated with larger income inequalities (Glaeser & Redlick, 2008), meaning that there are greater differences between rich and poor in urban areas. But since, on average, urban areas are wealthier, this can explain the insignificant effect. On the other hand, in terms of socioeconomic status, people who dwell in a rural area are more homogenous (Nachtigal, 1982); they are either poor or rich. The gap between rich and poor in rural areas is thus not as great as in urban areas.

Second, trust and reciprocity are not significantly linked to children's probability of attending preschool. A household's trust is negatively correlated with its income and educational background, which implies that higher income and education are associated with lower trust. However, the fact that household income and education have a strong effect on children's preschool enrollment may absorb the effect of lower household trust. Household reciprocity was also found to be stronger in households with a lower educational background (Table 2b). But the strong effect of parental education on

children's preschool enrollment moderates the effect of this reciprocity in households with a lower educational background.

Third, living in communities with greater group associations and trust is not associated with children's probability of enrolling in preschool. These unexpected results are not easy to interpret. Maybe living in communities with higher group associations and stronger trust may facilitate parents' sharing of information, knowledge and expectations, which in turn may increase parents' awareness of the importance of preschool attendance. However, this may in itself not be sufficient to help low-income parents to send their children to preschool, as they may also need financial support.

Fourth, our interaction analysis at the community level leads to contradicting results. Living in an urbanized area significantly amplifies the effect of the community's level of group association on children's likelihood of enrolling in preschool, but residing in urbanized areas also significantly reduces the effects of community reciprocity on children's likelihood of enrolling in preschool. The negative interaction effect of living in urban areas with community reciprocity indicates that social and financial supports are more ubiquitous (and needed) in rural areas (Nachtigal, 1982). The positive effect of residing in urbanized communities with community association rates on children's chance of preschool participation is difficult to interpret. The challenge to sending children to preschool in urban villages could relate to preschool distance, which is easier to solve by collaborating to rent a vehicle for their transportation. Community associations could help to accelerate such collective action in urban villages. On the other hand, living in rural areas means that preschools are often not available, a problem not easily solved by collective action through group association.

All in all, we are aware that the survey data we used are cross-sectional and cannot provide strong empirical evidence for the mechanisms at play. We have to leave this for future work. We also realize that we cannot interpret our estimates as a causal impact of household- and community-level factors on preschool participation. However, although our analysis was constrained by these limitations, the results do suggest some policy implications.

First, our results show that SES remains an important determinant of children's preschool participation, indicating that preschool accessibility is a serious problem in Indonesia. It is difficult and time-consuming to improve parental education (Huisman & Smits, 2009). Therefore, in order to stimulate parents to send their children to preschool, improving access by providing more preschools and reducing financial barriers are more feasible policy interventions. Due to the scarcity of government resources, one solution could be to merge preschools and primary schools, especially in rural villages without preschool facilities. Merging preschools with public primary schools would not only increase access but could also make preschools affordable or free.

Second, the strong positive effect of access to media, which is independent of all other factors and circumstances studied both at the household and community levels, indicates that mass media can be a very important instrument to enhance parents'

awareness of the importance of preschool enrollment; this is given that most parents in Indonesia have a primary education background and have thus not yet experienced the possible benefits of preschool attendance. However, because almost all Indonesians have access to radio and television, mass media are among the available tools to increase parents' awareness of the importance of preschool attendance.

Third, the strong positive effect of household group associations indicates that social capital as measured by group associations is an important factor to increase the likelihood of children attending preschool. This result suggests that a government campaign to increase parents' awareness of the importance of early child education could make use of such group associations, which are omnipresent in Indonesia. For instance, the government could stimulate trained cadres in each village and community to approach these associations to discuss the important role of preschool attendance on children's school readiness and as a foundation for creating active and responsible citizens, also in the group associations themselves.

Finally, community reciprocity, measured by one's readiness to borrow and/or to lend money, also has a positive effect on children's preschool attendance. This effect tends to be stronger in low-income families in rural communities, indicating that community reciprocity is a pivotal buffer, particularly when *households* experience *economic shocks*. This finding suggests that policy interventions to improve preschool participation need to conserve community reciprocity as a potential buffer for low-income families. This consideration may prevent government interventions from weakening the existing positive effects of reciprocity, but rather help governments to strengthen the effectiveness of their interventions by collaborating with the informal social networks available in the community.

4

The impact of decentralization on educational attainment in Indonesia

Abstract

This study contributes to our knowledge on the impact of decentralization of the education sector in Indonesia. We extend existing research by examining the influence of both municipal factors and other explanatory variables on educational attainment in Indonesia. We focus on mean years of schooling as an indicator of educational attainment. We hypothesize that after decentralization, 1) educational attainment is higher compared to the pre-decentralization era, 2) regional variations in educational attainment will have increased, and 3) the fiscal capacity, degree of urbanization, and development will be higher; the higher the municipality's mean year of schooling. The latter is also expected for the newly created municipalities of the past years. We test the hypotheses with panel data on 5,541,983 respondents aggregated to 3,880 observations nested in 491 districts/cities nested in 32 provinces for the pre and post-decentralization era. The results reveal the following. First, after decentralization, the length of schooling slightly increased but progress in the length of schooling has slowed down a bit. Second, educational attainment variation between provinces slightly decreased but the variation among municipalities increased. Third, the degree of municipalities' development and urbanization have a significantly positive impact on improving educational attainment while the fiscal capacity and the status of being a new municipality do not have a significant effect on extending the length of schooling. Our findings suggest that especially rural areas and less developed municipalities have lagged behind in the attempt to improve Indonesia's educational attainment.

This chapter is based upon:
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4.1 Introduction

Decentralization has become a global phenomenon that has taken place in more than 80 percent of the world's countries, in both developed and developing countries (Manor, 1999). Many donor agencies and development institutions promote decentralization as a major element in good governance efforts (Berg-Schlosser, 2004). From a good governance perspective, decentralization entails bottom-up planning as a strategy to capture and address local needs and aspirations (Johnson, 2001; Devas, 2002), and to achieve responsiveness and accountability of policy makers to local citizens (Crook & Manor, 1998). Reasons to implement decentralization are diverse, ranging from international economic pressures to internal demands for increased citizen participation (Duncan, 2007).

For a long time, Indonesia was one of the most centralized nations in Asia (e.g. Budiman, 1988; Mackie & MacIntyre, 1994; Nordholt, 2003). This situation changed dramatically when the Indonesian government initiated a decentralization wave in 2001. The country was decentralized in the hope to realize a modern, decentralized administrative system that would accelerate the improvement of public services, particularly in the education field (BEC-TF, 2010).

Since the 1990s, education has been an increasingly important policy domain in Indonesia. Education is perceived as crucial to the country's economic transition from an agricultural to an industrial economy that increasingly depends on the skills of employees (Jeon, 2011). In addition, Indonesia is a socially and ethnically diverse country, with over 300 distinctive ethnic groups and 742 different languages and dialects (Unesco, 2011). Universal education is assumed critical to strengthen social cohesion among citizens, which in turn is important to maintain political stability as well as sustainable economic growth (Unesco, 2011).

The decentralization of education was expected to become a stepping-stone to improved educational outcomes in Indonesia. In the decentralization literature, there are two perspectives on the link between decentralization of education and educational outcomes. Proponents of the first perspective argue and present evidence for a positive effect of education decentralization, such as Heredia-Ortiz (2007). In Indonesia, for example, Simatupang (2009) showed that on average most education outcomes significantly changed for the better after decentralization. Moreover, local governments were found to respond better to local needs for education services, as indicated by improvements in the national average years of schooling, adult literacy rates, female literacy rates, and lower high school dropout rates. In addition, several evaluation findings showed that decentralization leads to service provision practices that are closer to the local people's needs (Usman, 2001; UNDP, 2002; Sumarto, Suryahadi, & Arifianto, 2004).

However, proponents of the second perspective present studies showing that decentralization has a negative impact on educational outcomes (see, for instance

Treisman, 2000). In the Indonesian case, Kristiansen and Pratikno (2006) for example presented evidence that decentralization of education almost tripled the school costs. Consequently, parents may be asked to pay more for their children's education, which may lead to school dropout. Others added that after one decade of decentralization in education, Indonesia's education service is still not satisfactory because of a lack of competence of the education district offices, which will also hamper educational outcomes (Haryanto, 2010).

In sum, previous studies produced inconsistent and contradicting evidence on the impact of decentralization on improving one particular educational outcome in Indonesia, namely years of educational attainment. This study aims to explain these inconsistent findings by focusing on the variation in educational services and outcomes in the various administrative levels that came into existence with Indonesia's decentralized system of governance.

We assume that decentralization enables the local government to properly respond to local demands to improve government accountability and to innovate and advance their effectiveness in the educational field, which may lead to improved adults' educational attainment and thus to a sustainable society. However, next to the positive effects, decentralization may have negative effects on educational outcomes, depending on the functioning of the lower administrative levels as a new actor in educational service provision. Therefore, decentralization does not necessarily have a positive impact on educational attainment; this depends on regional characteristics and a local government's implementation capacity and quality. For example, the reduced power and information position of the central education ministry could lead to system collapse (Madeira, 2012). Decentralization can also lead to confusion over education management and policy implementation, which can negatively affect educational effectiveness and efficiency (Treisman, 2000).

Nevertheless, if planned and implemented properly, decentralization has the potential to improve education services, and thus educational attainment, connecting local level aspirations and preferences. Likewise, decentralization can also strengthen accountability because it provides robust incentives for local administrative levels to work towards better education services. Decentralization is thus likely to generate differential effects on educational attainment in the various regional and local levels.

4.2 Research questions

Given that the decentralization process in Indonesia led to more autonomy in educational policymaking and implementation, we assume that regional differences and variation in local authorities' capacities to manage the education system have increased. The main research question of this chapter is, therefore: *To what extent did the decentralization of*

Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels?

In this study, educational attainment is operationalized by length of schooling received. The two sub questions that guide this paper are (1) to what extent did length of schooling change before and after decentralization and (2) to what extent does length of schooling vary within and between local administrative levels?

In the remainder of this chapter, we first discuss both the social and scientific contribution of this paper, followed by the research design and methodology. Before presenting the theoretical framework and hypotheses, we briefly describe the setting of educational decentralization in Indonesia. We then discuss the empirical findings in relation to the research question and hypotheses, and close with the conclusion and recommendations.

4.3 Social and scientific significance

Indonesia is an interesting decentralization case to study since it implemented the decentralized system as a "big bang" (World Bank, 2003). It changed from one of the most centralized countries to one of the most decentralized in the world, after it bestowed power and authority from the central government to the local level (Nordholt, 2003). This big bang of decentralization allows the study of its impact on service provision in the educational sector.

This chapter contributes to the existing literature on decentralization in education by presenting a before and after analysis of the impact of decentralization on changes in educational attainment in Indonesia. We use panel data of the pre-decentralization era (1996-1999) and the post-decentralization (with direct elections) era (2008-2011). The scientific relevance of this study is thus in analysing the effect of decentralization on regional inequality. Despite a considerable number of studies on the impact of decentralization on educational attainment, to our knowledge no explicit exploration of the conditions under which decentralization may have positive and/or negative effects on educational attainment has been carried out in Indonesia.

The societal relevance of the study is to provide insights that may be helpful in developing context-specific policy interventions aimed at improving educational attainment in specific regional situations in Indonesia. These insights are important for creating effective and targeted government interventions as part of Indonesia's good governance ambitions in terms of voice and accountability as well as government effectiveness, which are both important World Bank good governance indicators (Kaufmann, Kraay, & Mastruzzi, 2009). Voice and accountability capture perceptions of the extent to which the citizens are able to participate in selecting their government. Government effectiveness captures perceptions of the quality of public services, the quality of policy formulation, and implementation (Kaufmann *et al.*, 2009).

4.4 Research design and methodology

In the following sections, we first present a review of the international literature on decentralization in the Indonesian context and then develop three hypotheses that will guide subsequent statistical analyses. We employ both descriptive statistics and multilevel regression analyses (see, *e.g.* Snijders & Bosker, 2011). Looking at the nature of decentralization, which involves a multilevel government structure, we need to consider these various levels in our analysis to comprehend the effects of decentralization at these levels.

Even though decentralization in Indonesia mainly pertains to the district and city level, the impact at the province level is also critical because, since 2008, the central government has mandated governors as central representatives to coordinate among districts and cities. We take into account the impact and interdependence of these various levels (municipalities and provinces), where each province consists of several municipalities. We included different time points related to the two decentralization phases: four years before decentralization from 1996 to 1999 and four years after decentralization with democratization (2008 to 2011).

In this manner, we can study the change in educational attainment measured by length of schooling from the pre-decentralization period to the post-decentralization period, and the development in length of schooling over the years as expressed by the mean length of schooling and the correlation matrix. We tested the impact of four important factors affecting educational attainment: the municipalities' fiscal capacity, the proportion of urban area, the municipalities' type and level of development, and the municipalities' establishment (i.e., whether new or not). Moreover, we tested the stability of the effect of the control variables over time, by including so-called cross-level interactions (Snijders & Bosker, 2011).

4.5 Decentralization and education in Indonesia

The concept of decentralization is broad and varied. Rondinelli and Nellis (1986, p.5) define decentralization as "the transfer of responsibility for planning, management, and the raising allocation of resources from the central government and its agencies to field units of government agencies, subordinate units of levels of government, semi-autonomous public authorities or corporations, area-wide, regional or functional authorities, or non-governmental private or voluntary organizations". Likewise, Mawhood (1983) simply defines decentralization as the devolution of power from central to local governments, whereas others define it more precisely as a transfer of authority and responsibility for public functions from the central government to subordinate or quasi-independent government organizations (Cohen & Uphoff, 1997; Litvack, Junaid, & Richard, 1998; UNDP, 1999).

Conceptually, there are different types of decentralization, depending on the degree of autonomy granted to the local level (for a discussion of these types sees Uphoff 1997; Litvack *et al.*, 1998; UNDP, 1999). The World Bank (2004) categorized the decentralization process in Indonesia as *devolution*, which is defined as a transfer of authority through which the central government moves responsibility and certain functions to quasi-autonomous units of local governments that are beyond its direct control. Devolution is considered the most rigorous type of decentralization (Cohen & Peterson, 1999)

The way in which the Indonesian education system is based on the decentralization policy is described in both Regional Government Law and Regional Fiscal Balance Law.[6] These laws rearrange the roles, functions, and responsibilities among government levels and they were a starting point to implement direct elections. While steps towards decentralization were already taken in 2001, it was not until 2004 that the governors, mayors, and heads of district were given even more autonomy due to the introduction of direct elections at the local level (Sjahrir & Kis-Katos, 2011). Direct elections demand that local leaders not only take into account the orders of the central government but also consider the aspiration of the voters. Consequently, decentralization gives more opportunities for local governments to exercise their decision-making authority to pursue their objectives.

The introduction of direct elections stimulated all local leader candidates to offer attractive promises in their campaigns, including, for example, a commitment to abolish education fees, so that voters elect them. Free education, therefore, has appeared as a prominent topic in almost all local political contests since. Several studies conclude that in direct elections, education has usually become a strategy for candidates to gain popular votes (Sifuna, 2005; Oketch & Rolleston, 2007).

In the decentralized system, the central government annually allocates more than 32 percent of the government expenditure to the provinces, districts, and cities (*Budget Statistics,* 2006-2012). Such allocation provides more options for local governments to improve public services, particularly in the education sector, because it is stated in the constitution that governments (central, provincial, district, and municipal level) are obliged to allocate a minimum of 20 percent to the education sector. Moreover, the local governments also received enormous human resources transfers: more than 2.6 million public servants are currently working at the lower level (World Bank, 2003), of which the majority work in the education sector, such as teachers, principals, and staff of local education offices.

The Constitution of Indonesia states that every citizen shall have the fundamental right to obtain education (Indonesia constitution, preamble). Operationally, the Indonesian education system is based on Law no. 20/2003 of the National Education System that integrates various types of education, including general, technical and

[6] The Regional Government and Regional Fiscal Balance Law No. 33/2004.

vocational, and madrasah (religious) schools, both formal and non-formal. Under this law, formal education is defined by the following: (1) pre-primary education for the age 4-6, (2) six years primary education for ages 7-12, (3) three years lower secondary education for ages 13-15, (4) three years upper secondary education for ages 16-18, and (5) higher (tertiary) education (Law no. 20/2003).

The government initially launched a six-year compulsory education requirement in 1984, which was followed by introducing a nine-year compulsory education system in 1994 (Arina, 2011). Currently, the decentralized education system deals with more than 50 million students ranging from primary to senior secondary education in 247,383 schools with more than 42 million pupils enrolled in compulsory education (Central Bureau of Statistics or CBS, 2014). Tertiary education is centrally administered and it consists of 5 million students in 3,815 public and private higher education institutions (CBS, 2014).

After more than one decade of education decentralization, the inputs of the education sector have consistently increased, especially after the fully decentralized system was implemented with almost all local government leaders being directly elected. This is indicated by an increasing number of schools from 227,481 in 2005/2006 (as a point of departure for the initiation of direct elections) to 231,823 in 2008 when all the local governments' leaders were directly elected. This growth in the number of schools continued to 234,771 in 2009/2010 and 247,383 in 2011/2012 (CBS, 2014).

The fact that the government provided the funds to establish more schools as a way to improve access to education, also resulted in rising enrolment rates both in compulsory education (pupil age 7-15 years) and in years beyond compulsory education. For example, school enrolment rates of pupils in the age of 7 to 12 years consistently increased from 95 percent before the decentralized system in 1999 to 98 percent in 2012. Likewise, school enrolment rates of pupils in the age of 13 to 15 years rose tremendously from 79 percent in 1999 to almost 90 percent in 2012. Also school enrolment rates of pupils between the ages of 16 and 18 years increased considerably from 51 percent to almost 61 percent (CBS, 2014). To conclude, at the national level, overall access to education improved after one decade of decentralization.

4.6 Theory and hypotheses

Theoretical work about the impact of government decentralization dates back to the early 1970s. Oates (1972) introduced the preference-matching argument, reasoning that decentralization will improve allocative efficiency by bringing greater diversity into the supply of public services, because decentralization allows serving a diverse set of preferences for public goods. Oates (1972) and Tiebout (1956) also argued that decentralization leads to an efficient provision of public goods because local preferences are better served than in the case of centralization.

The basic assumption behind such claims is that decentralization stimulates political accountability, which will have a positive effect on government efficiency. Elections provide accountability through two different, although related, effects. First, it creates a selection effect, since voters can decide not to re-elect incompetent incumbents. Second, it promotes an incentive and discipline effect, since unsuccessful incumbents have an incentive to improve the quality of government in order to increase the probability of re-election (Besley & Smart, 2007).

Due to these two effects, it is assumed that decentralization and direct elections enable local people to choose local government leaders who are responsive and accountable. In turn, these local leaders will have an incentive to absorb local preferences and to develop context-specific policies and programs. Decentralization is thus assumed to lead to informational advantages on the side of local governments (Hayek, 1948), as well as to more attention to preference heterogeneity and to more opportunities to control agency problems (Tommasi & Weinschelbaum, 1999; Bardhan, 2002).

Increased local government resources will positively reinforce this process, because it gives local governments even more autonomy to design and plan context-specific educational programs and to promote local government ownership, which is important to strengthen local government control (Simatupang, 2009). The resulting context-specific educational programs, based on appropriate control, are expected to lead to improved educational outcomes (Sjahrir & Kis-Katos, 2011), because these programs can incorporate the social, cultural and geographical diversity in municipalities, which was neglected in the centralization era due to a one-size-fits-all development policy.

The above arguments align with Faguet and Sanchez' findings (2006) that showed decentralization improved public school enrolment in Colombia. Their study also showed that in highly autonomous districts characterized by less central government control, enrolment rates increased while in districts with greater control from the central government enrolment rates declined. Similarly, for the Argentinian case, Habibi *et al.* (2001) found that decentralization had a positive and significant impact on enrolment rates. This led them to conclude that decentralization is positive for education because it allows local governments to raise more of their own resources, which is conducive to improving educational output. Therefore, the first hypothesis reads: *Compared to the pre-decentralization era, the progress in the mean length of schooling is higher overall after decentralizing Indonesia's educational sector (H1).*

Whereas we expect that overall more progress will be made in educational attainment, in terms of an increasing length of schooling after decentralization, decentralization can also have a negative effect by creating more regional variation. We expect that some regions will benefit more than others from the decentralization process for the following reasons. First, transferring the decision-making authority closer to local people might only generally yield positive results if the local government's capacity is adequate. The other way around, the benefit of decentralization may be weakened when local governments lack technical capabilities. For example, Galiani and Schargrodsky's

findings (2002) showed that the effect of decentralization on educational outcomes in Argentina is generally positive, but that its impact is stronger in provinces that are fiscally better managed. Conversely, the impact is negative for schools located in poor provinces with lower fiscal capacity.

Second, although local people's aspirations regarding public services might be similar, the local voters' preferences in policy domains may vary depending on local characteristics. For instance, in some districts, most people might favour a better transportation infrastructure over a better education system, whilst in other districts one may prioritize the education sector. These assorted decisions may influence the success of public services, such as education. It implies that if local governments based on voters' preferences place education services as the highest priority, education service delivery is more likely to improve. On the other hand, if local governments do not emphasize education services, the results may be the opposite.

Third, local governments differ in terms of resources and constraints that may affect education services (Kaiser, Hofman, Kadjatmiko, & Suharnoko, 2006). For example, some municipalities, which have revenue sharing from oil and mining, generate much more revenue that can be spent on education, while other municipalities do not have this source of income. In terms of governance, variations among municipalities may thus influence the effectiveness to provide better educational services.

To summarize, local governments' disparities regarding voters' preferences, decision-making and implementation capacity, and resources and constraints may intensify regional variations in educational outcomes, such as educational attainment. We therefore expect that after implementing decentralization, variability in length of schooling between municipalities and between provinces increases. Thus, the second hypothesis reads: *Compared to the pre-decentralization era, regional variation in education attainment both in municipal and provincial level is higher after decentralizing Indonesia's educational sector (H2).*

As we argued, the effect of decentralization on educational attainment is expected to be influenced by a local government's capacity, such as human, financial and information resources, and infrastructure (Williamson, Rajabifard, & Enemark, 2003). Various aspects matter in this regard, the first one being fiscal capacity[7]. Subroto (2007) found, for example, that the decentralized system increased fiscal capacities of municipalities in Indonesia and thus may increase local government education expenditure. However, Subroto (2007) found that decentralization increased disparities in education expenditures per student, which thus enlarges the gaps in fiscal capacities for education across municipalities.

[7] According to Ministry of Finance decree No. 54/PMK.07/2014, fiscal capacity refers to an overview of each region's financial capacity which is reflected through the general revenue in Local Government Budget (excluding Special Allocation Fund, Emergency Fund, old loans, and other revenues restricted for financing certain expenses) to fund the government's duty net of personnel expenditures and the number of poor people.

The capacity of municipalities is influenced by other characteristics as well. Whether a municipality is urban or rural, for example, may relate to lower per capita cost of providing education service (Jayasuriya & Wodon, 2003). Kessides (2005) argues that efficiency would be better in urban than rural areas because monitoring may be easier in urban areas. Urban areas also often have better infrastructure and facilities, such as good transportation. This facilitates short travel distances to school, which stimulates education attainment (Johansone, 2010). In addition, living in urban areas provides better reinforcement for students' school completion. Therefore, we predict that the type of municipality administration and level of the socio-economic development effect on the education service.

Furthermore, referring to the Regional Government Law No. 32/2004 and the Ministry of Development for Disadvantage Regions (MDDR) decree on list of underdeveloped districts, we assume that cities have more resources than district as indicated by Gross regional product (GRP) (Halim, 2002). In addition, Prud'homme (1995) points out that economic activity and average income in a city is larger than those in a district. Moreover, in terms of socio-economic circumstances, the government defines that an underdeveloped district is in general worse than a developed district (MDDP, 2014).

Fourth, local government proliferation policy, including at municipality might influence on variations in capacity of the municipality. We that municipality proliferation is matter whether a municipality is newly established or not.[8] Studies on the impact of local government (municipality) establishment and formation have varied in terms of their conclusions about the possible outcomes of establishing new municipalities (Brancati, 2006). In the Indonesian context, Qibthiyyah (2010) shows that the impact of the creation of new local governments is not uniform across the effected local governments. Her findings show support for the existence of improved education outcomes in new local governments as represented by a reduction in the dropout rate. Qibthiyyah (2010) explains that the presence of spill over may be signaled by a relatively worse outcome in the originating municipalities during the post-event of municipality creation in contrast to outcome improvement in the new municipalities. The findings also imply the creation new municipalities tend to improve service delivery from higher accountability and higher intergovernmental transfers.

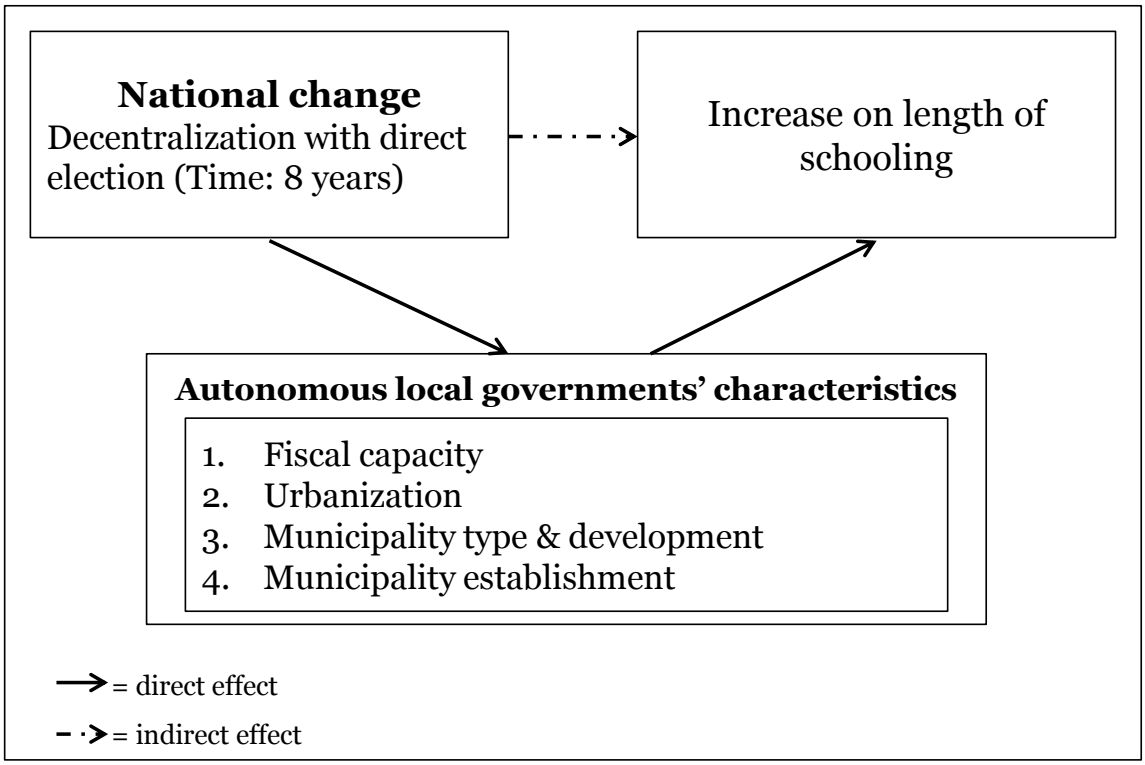
Based on the above, we decided to include four proxies into our analysis that provide information about a municipality's capacity: (1) the local government's fiscal capacity; (2) the proportion of urban area (urbanization), which influences the economies of scale; (3) the type of municipality administration and level of the socio-economic development; and (4) the type of new municipality establishment. The third hypothesis expects: *the higher the fiscal capacity, and the degree of urbanization and development*

[8] In the context of Indonesian, decentralization intertwines with a policy to create new municipalities, i.e., the creation of new local governments one part of the decentralization program in Indonesia. According to Harmantyo (2011), a number of municipalities have increased from 319 in 1999 to 524 in 2010.

and if a municipality is newly created, the longer the municipality's mean year of schooling (H3).

Based on those arguments, the theoretical framework could be systemized in figure 4.1.

Figure 4.1 Theoretical Framework



4.7 Data and method

4.7.1 Data and measurements

The most important source of data for our analysis was a rich, annual nationwide survey: the national socio-economic survey (Susenas) from the *Indonesia Central Bureau of Statistics* (CBS). The Susenas is a nationwide survey conducted to gather basic social and economic information as a main source of monitoring indicators of social and economic development in Indonesia. During 1963-1978, it was conducted every two years and then it was done on an annual basis until 1992. Since 1992, in addition to the basic social and economic questionnaire (the Core), an additional questionnaire was introduced which gathers more detailed information on special interest topics (the Module). The Susenas Core is conducted on an annual basis in July while the Susenas Module is conducted

every three years in July. The Susenas Core annually covers eight indices: demography, health, education, labour, fertility and family planning, housing, and consumption (CBS, 2013).

We combined the Susenas data with data on municipality development from the Ministry for the Development of Disadvantaged Regions (MDDR) in 2011 and from a database of newly created municipalities from the Ministry of Home Affairs (MoHA), which was updated and adjusted for 2008-2011. We selected data at four time points before decentralization (1996-1999) and four time points after decentralization (2008-2011). Additionally, we employed a fiscal capacity index from the Ministry of Finance (MoF). We exclude all municipalities in the Jakarta province because these are not autonomous entities, as they are centrally managed by the province as part of its metropolitan character. Thus, we constructed panel data that contain four years before decentralization and four years after decentralization, based on 5,541,983 pupils in 491 municipalities (districts/cities), and nested in 32 provinces.

4.7.2 Variables

Educational attainment is operationalized by length of schooling measured by the average number of years of education received by people aged 15 and older, using official durations of each level (Barro & Lee, 2010), weighted with CBS population weights. We constructed the annual municipalities' length of schooling from the Susenas datasets by combining the questions: (1) highest education completed and (2) highest school grade ever achieved or is currently attending. We then converted them into years of education, ranging from: 0 for no schooling; 0-6 for primary school grades; 6-9 for junior secondary school grades; 9-12 for senior high school grades; 13-15 for higher vocational education (diploma I, II, and III); and 16 for bachelor and more.

Decentralization period indicates the calendar years 2008-2011, to facilitate the comparison of average length year of schooling in municipalities before and after decentralization. In addition, we constructed eight dummy variables pertaining to four years before decentralization (1996-1999) and four years after decentralization (2008-2011).

Fiscal capacity as defined by the Ministry of Finance (MoF, 2011) is classified in four ordinal categories: low fiscal capacity (index <=0.5) as 1; middle fiscal capacity (0.5<index<1) as 2; high fiscal capacity (1<=index<2) as 3; and the highest fiscal capacity (index>=2) as 4. Data on the fiscal capacity is only available after decentralization because before decentralization the local governments were not autonomous entities. Moreover, due to the calculation method, the index criteria changed over time. We therefore only utilized the fiscal capacity in one year (2010) using criteria on the basis of

the local government's own-source revenue (*pendapatan asli daerah*, PAD) + revenue sharing fund (*dana bagi hasil*, DBH) + general allocation fund (*dana alokasi umum*, DAU) + other revenues + personnel expenditure/the number of poor population.

Urbanization is annually measured by the proportion of urban area in the municipalities. This is coded 0 to 1, with zero referring to a municipality with mainly rural area and one for a municipality with mainly urban area (from Susenas 1996-1999 and Susenas 2008-2011).

Municipality's type and level of development represents the socio-economic level of development in 2011, with a code 0 for the least developed district; 1 for a developed district; and 2 for the city administration area (from MDDR).

Municipality's establishment from 2008-2011 is coded 0 for an old municipality and 1 for a newly established municipality (MoHA, 2012).

4.7.3 Statistical analysis plan

The first step in the analysis was to describe the development in the average length of years of schooling over the years before and after decentralization, both at the municipal and provincial levels. After presenting descriptive statistics, we conducted a three-level (year, municipality, and province) regression analysis in MLwiN 2.30 (Rasbash, Steele, Browne, & Goldstein, 2014) with correlated (random) year effects (a 'fully multivariate' model, see chapter 16, Snijders & Bosker, 2012). This modelling approach allowed us to take into account the hierarchical nature of our data and to test the hypotheses of period (at the year level) and municipalities.

After assessing the overall mean and variances at the three levels in the so-called null model (without any covariates), we included the parameters for eight years (with 1996 as the reference year) to estimate the progress of schooling over time in Model 1. Then, in Model 2, we incorporated the contextual factors at the municipality level, which allowed us to estimate the effects of fiscal capacity, urbanization, and municipality's type and status, and municipality establishment. In a third model, we employed cross level interactions to test the difference in (effects on) progress of educational attainment after the education decentralization. This model turned out not to be an improvement over Model 2 in terms of meaningful effects and by comparing their deviances to assess the relative fit of the models by means of a chi-square test (see for a further explanation Snijders & Bosker, 2012). Therefore, the estimates of the third model are not presented.

In the next sections, we first show descriptive statistics, then turn to testing the hypotheses by interpreting the results of Models 1 and 2.

4.8 Results

4.8.1 Descriptive results

Table 4.1 presents descriptive statistics for the average length of schooling at the municipal level before decentralization, starting at 6.41 years of schooling (SD 1.36) in 1996 to 7.38 years of schooling (SD 1.58) in 1999. Meanwhile, after decentralization the mean year of schooling at the municipal level was 7.70 (SD 1.48) in 2008 and increased to 8.0 (SD 1.56) in 2010. Then, it decreased to 7.98 years (SD 1.57) in 2011. In addition, the variation of the length of schooling consistently increases before decentralization but it fluctuates after decentralization.

At the provincial level, before decentralization, the mean year of schooling consistently increased from 6.66 (SD 0.77) in 1996 to 7.73 (SD 0.87) in 1999. After decentralization, it similarly rose from 7.93 (SD 0.69) in 2008 to 8.28 (SD 0.81) in 2011. At provincial level, the pattern is slightly different with the municipal level: both variations of the length of schooling before and after decentralization grow constantly. Moreover, variability at the municipal level is higher than at provincial level as is clearly shown by the standard deviations.

The fiscal capacity of municipalities is mainly low with an average of 1.9 on a scale from 1 to 4. Meanwhile, the percentage of urbanized municipalities went up from 28 percent in 1996 to 36 percent in 2011. Urbanized municipality variations slightly increased from 0.07 before decentralization to 0.10 after decentralization. Additionally, the variable type of administration and status of development indicates mainly developed municipalities (mode=1). The majority (59%) of the 491 municipalities are old established municipalities, which are, already existed before decentralization. The rest (41%) are newly created municipalities, proliferated after decentralization.

Table 4.1 Descriptive Statistics. $N_{level\ 1=3,928}$; $N_{level2=491}$; $N_{level3=32}$.

Variables	Years	Min	Max	Mean/*mode*	SD
Municipality level (N=491)					
- Mean year of schooling	1996	2.1	10.5	6.41	1.36
	1997	2.3	10.5	6.66	1.37
	1998	2.5	12.1	7.27	1.57
	1999	2.8	12.2	7.38	1.58
	2008	1.7	12.0	7.70	1.48
	2009	1.0	12.1	7.88	1.58
	2010	0.5	12.3	8.00	1.56
	2011	0.9	12.2	7.98	1.57
- Urbanization	1996	0.0	1.0	0.28	0.26
	1997	0.0	1.0	0.28	0.26
	1998	0.0	1.0	0.28	0.26
	1999	0.0	1.0	0.30	0.27
	2008	0.0	1.0	0.36	0.31
	2009	0.0	1.0	0.36	0.32
	2010	0.0	1.0	0.37	0.31
	2011	0.0	1.0	0.36	0.31
- Fiscal capacity	All years	1.0	4.0	1.90	1.06
				1.00	
- Type and development	All years	0.0	2.0	0.81	0.73
				1.00	
- Establishment (new)	All years	0.0	1.0	0.41	0.49
Province level (N=32)					
- Mean year of schooling	1996	4.9	7.8	6.66	0.77
	1997	5.4	8.2	6.92	0.73
	1998	5.9	8.8	7.58	0.77
	1999	6.0	9.1	7.73	0.87
	2008	6.5	9.0	7.93	0.69
	2009	6.6	9.6	8.14	0.74
	2010	6.5	9.7	8.28	0.78
	2011	6.0	9.9	8.28	0.81

4.8.2 Multilevel analysis

The null model presented in Table 4.2 shows that on average Indonesian citizens received approximately 7.5 years of schooling. Based on the presented variances (in the random part in the table), the differences between municipalities is largest (59%, see footnote 1 in Table 2), followed by differences between the years (27%). The differences between provinces are relatively low (14%). Extending the model with separate parameters for all years shows that there is indeed an increase in educational attainment from approximately 6.5 years of schooling in 1996 (the intercept of Model 1 in Table 4.2) to approximately 8 years in 2011 (6.479+1.571).

Moreover, Model 1 reveals smaller differences between municipalities in the earlier two years before decentralization, (the random part of Table 4.2 show variances of approximately 1.4 for 1996 and 1997) compared to the other years with estimated variance equal to approximately two. Model 1 is an improvement over the simple null model, as is confirmed by the decrease in deviance from 10,973.1 (Null Model) to 5,842.3 (Model 1).[9] After including the four explanatory variables (fiscal capacity, urbanization, municipality's type and status, and municipality establishment), the values of the variances significantly decline ranging from approximately 0.6 to 0.9 (not shown in the table). The deviance difference between Model 1 and Model 2 was 884.9. This difference is significant when tested against a chi-squared distribution test with five degrees of freedom (corresponding to the five added fixed parameters). The effects of urbanization and type of the municipality were both significant.

Overall, the trend in the length of schooling at the municipal level shows a constant increase where the aggregate improvement after decentralization (2008-2011) is smaller than before decentralization (1996-1999). Table 4.2 reports the incremental increase of the length of schooling from 0.25 years in 1997 to 0.97 years in 1999 and from 1.29 years in 2008 to 1.57 years in 2011. During the four years before decentralization, the mean length of schooling at municipal level amplified by approximately 1 year with an annually increase of 0.32 years. On the other hand, for the duration of four years after decentralization, it increased by about 0.28 years, which is annually only 0.09 years.

Our first hypothesis proposed that compared to the pre-decentralization era, the progress in length of schooling is higher after decentralizing Indonesia's educational sector. Although the length of schooling slightly increased, the progress in length of schooling declined in the post-decentralization era. Both Models 1 and 2 in Table 4.2 provide clear evidence to refute this hypothesis, indicating a progress of approximately 0.9 in the pre-decentralization era and approximately 0.3 in the post-decentralization era.

[9] The difference in deviance of 5,130.8 is tested with a chi-squared distribution with 35 degrees of freedom (df, the number of added parameters, 7 'fixed' year effects and 28 'random' correlations, see Table 4.3).

Table 4.2 Multivariate multilevel regression analysis of mean years of schooling
$N_{level\ 1=3,928}$; $N_{level2=491}$; $N_{level3=32}$

	Null Model ①		Model 1②		Model 2③	
	Coeff.	***S.E.***	***Coeff.***	***S.E.***	***Coeff.***	***S.E.***
Fixed Part						
Intercepts	7.479***	0.123	6.479***	0.121	6.390***	0.129
Level 1: Years						
Years: 1996 (ref.)						
1997			0.248***	0.016	0.235***	0.016
1998			0.854***	0.019	0.840***	0.019
1999			0.971***	0.026	0.918***	0.025
2008			1.292***	0.037	1.086***	0.027
2009			1.470***	0.041	1.266***	0.032
2010			1.590***	0.038	1.358***	0.031
2011			1.571***	0.040	1.354***	0.032
Level 2: Municipalities						
Fiscal Capacity						
(Fiscal-gm)					0.023	0.018
Urbanized municipalities (%)						
(Urban-gm)					2.553***	0.082
Municipalities' type: Less developed (ref.)						
Developed district					0.304***	0.087
City					0.493***	0.101
Municipalities' establishment: Old municipality (ref.)						
New municipality					-0.007	0.069
Random Part						
Level 3: Province	0.357	0.120	0.361	0.107	0.366	0.100
Level 2: Municipality	1.486	0.104				
Level 1: Years	0.665	0.016				
1996/1996			1.431	0.093	0.549	0.036
1997/1997			1.462	0.095	0.599	0.039
1998/1998			2.096	0.136	0.913	0.060
1999/1999			2.092	0.136	0.916	0.060
2008/2008			1.814	0.118	0.690	0.045
2009/2009			2.038	0.133	0.937	0.061
2010/2010			2.036	0.132	0.905	0.059
2011/2011			1.962	0.128	0.855	0.056
*-2*loglikelihood:*	11034.1		5926.9		5042.0	

Notes:

① We calculate variances in mean year of schooling from Model Null: (1) level 1 (years) is 27% (0.665/[0.357+1.486+0.665]); (2) level 2 (municipalities) is 59% (1.486/[0.357+1.486+0.665]); and (3) level 3 (provinces) is 14% (0.357/[0.357+1.486+0.665]).

② We construct dummy variable for years with 1996 as reference, the estimate coefficients (β) increased from 0.248 in 1997 to 1.571 in 2011. Mean year of schooling in 1996 is 6.48 years and the highest change is from 6.728 (6.48 + 0.248) in 1997 to 7.334 (6.48 + 0.854) in 1998.
③ From Model 2, we can see that if in 2011 the length of schooling average is about 8 years, the average length of schooling are: 10.6 years (8+2.553) for people living in urban area, 8.3 years (8+.304) for people in developed district, and 8.5 years (8+.493) for people in city area. Random slopes in Model 2 showed that variations over years are wide-ranging from low to high variations. For example, the low variations are 0.549 and 0.599 in 1996 and 1997, while the high variations before decentralization are 0.913 (1998), 0.916 (1999) and after decentralization are 0.690 (2008), 0.937 (2009), 0.905 (2010), 0.855 (2011).
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

The next hypothesis proposed that compared to the pre-decentralization era, regional variability in education attainment will be higher after decentralizing Indonesian's educational sector. The descriptive statistics in Table 4.1 indicate that before decentralization, the standard deviation of the length of schooling at the municipal level is overall slightly higher after decentralization by about 1.5 than before decentralization, where 1996 and 1997 have a standard deviation of 1.4. On the other hand, the average standard deviation of the length of schooling at the provincial level after decentralization are equal or even slightly lower than before decentralization (approximately 0.75).

The only partial support of the descriptive results for hypothesis 2 are supported by the estimates for the variances in the multilevel analysis, revealing the lowest variances in the pre-decentralization years 1996 and 1997, in both Models 1 and 2 in Table 4.2. In summary, results partially support the hypothesis that compared to the pre-decentralization era, variation in education attainment at municipal level is higher after decentralizing Indonesian's educational sector but the variation at provincial level is slightly lower.

For further interpretation of the pattern in variability, we can inspect the correlation matrix as shown in Table 4.3, which clearly demonstrates that the correlations between the years are high, the more so within the pre-decentralization and post-decentralization periods than between the two periods. The high correlations show that it is unlikely that length of schooling will change drastically from one year to the next; the somewhat lower correlations between the periods show a lower association between mean measurements of mean length of schooling that are at least 12 years apart (and hence more change).

Table 4.3 Estimated correlation matrix of mean years of schooling in pre- and post-decentralization years, based on Model 2 ($N=_{3,928}$).

Years ④	1996	1997	1998	1999	2008	2009	2010	2011
1996	1							
1997	0.897	1						
1998	0.908	0.927	1					
1999	0.825	0.807	0.864	1				
2008	0.726	0.722	0.723	0.680	1			
2009	0.692	0.687	0.665	0.615	0.813	1		
2010	0.706	0.713	0.688	0.633	0.842	0.832	1	
2011	0.671	0.673	0.657	0.598	0.836	0.818	0.910	1

Note:
④ Random slopes' correlations are strong both before decentralization (cf. correlations between 1999 to 1996, 1997, 1998 are .825, .807 and .864) and after decentralization (eg. Correlations between 2008 with 2009, 2010 and 2011 are .813, .842 and .836).

The last hypothesis suggests that the higher the fiscal capacity, degree of urbanization, and development, and if a newly created municipality, the higher the municipality's mean year of schooling. The findings partially support this hypothesis as illustrated by Model 2. It shows that the level of urbanization, the type of administration and development status of the municipalities have a significantly positive impact on the average length of schooling. Urbanization enables people at the municipality level to lengthen their schooling by maximally 2.6 years when comparing fully (100%) urban municipalities to completely rural areas (0% urbanization).

In addition, the municipal type and development status have a significantly positive impact on the length of schooling of about 0.3 years in a developed district and 0.5 years in a city administration compared to a less developed municipality. It implies that if in 2011 the length of schooling average is about 8 years, the average length of schooling is 10.6 years for people living in urban areas, 8.3 years for people in developed districts, and 8.5 for people in city areas. This finding shows that urbanization has the largest effect on educational attainment. On the other hand, the municipalities' fiscal capacity and the newly created municipalities do not have a significant effect on the mean length of schooling.

Moreover, whereas the municipalities' fiscal capacity has a positive direction, the direction of the newly created municipalities is negative effect on the mean length of schooling. It means that the higher the municipalities' fiscal capacity may increase the

mean length of schooling but the policy to create a new municipality may deteriorate the mean length of schooling.

4.9 Conclusion and discussion

Decentralization is expected to stimulate accountability and to empower local and subnational governments. Accountability as part of good governance is expected to enable local governments to improve their services in the educational sector. This study expands research on the impact of decentralization of Indonesia's education sector using a multi-level government approach. The handful of earlier studies examining the impact of the decentralized education system in Indonesia has mainly focused on one particular administrative level and neglected the hierarchical structure of Indonesia's administrative and government systems. Taking into account the nature of decentralization and its resulting multilevel government structure, by focusing on these various levels, help us better comprehend the effects of decentralization on educational attainment in Indonesia.

This study analyzed the impact of decentralization on educational attainment comparing two waves of administrative and political changes in the Indonesian government system. This endeavor enabled us to disentangle educational progress in relation to the centralization era and the decentralization era with direct elections (democratization). We thereby extended existing research by examining the influence of municipal factors and other determinants by using panel data from 5,541,983 respondents aggregated to 3,880 observations, nested in 491 districts/cities, nested in 32 provinces for the pre and post-decentralization era.

4.9.1 Summary of findings

In line with our theoretical expectations, our findings suggest that the length of schooling consistently improved both in the centralization and decentralization era. However, the progress in mean years of schooling after decentralization was smaller than before decentralization. Additionally, substantial variability in mean length of schooling is also observed after decentralization, even when taking into account municipality characteristics, such as urbanization.

This implies that decentralization is not a guarantee for improving educational attainment because of trade-offs between intended and unintended consequences. Decentralization may increase accountability and empower local governments to provide better education services but only if local governments have the capacity to do so. Therefore, decentralization increased people's educational attainment in some municipalities but not in others. Moreover, the mean years of schooling even decreased after decentralization in some municipalities.

Two of the four investigated municipality characteristics were shown to improve the length of schooling. The level of urbanization and the development status of a municipality have a significantly positive impact on the mean length of schooling. From this, we conclude that urbanization and municipality development, which is represented by a better infrastructure, more job opportunities and better health care, have a positive impact on improving quality of living in a municipality, as shown by others (cf. Filmer & Pritchett, 2001). This might be due to the fact, as argued by Buchmann and Brakewood (2000), that higher levels of development are more likely in urbanized districts, which often have better road and transport infrastructure and better educational opportunities. These increased educational opportunities likely lead to an increase in the length of schooling.

The municipalities' fiscal capacity or whether they are newly established municipalities do not have a significant impact on improving the people' average length of schooling at the municipal level after taking into account indicators of urbanization. Analyses from the World Bank (2008) suggest that net enrolment rates are positively correlated with education spending per student and with education spending as a share of overall municipality spending. However, the municipalities' fiscal capacity, the measure used in this chapter, does not always represent the education expenditure per student. The World Bank (2008) found that poor municipalities spend a larger proportion of their budgets in the educational sector than those in some of the richest municipalities do. The 40 percent of the poorest districts spend approximately 35.4 percent of their budget on education, while the richer districts spend 31.5 percent. Therefore, poorer municipalities are not necessarily lagging behind in education expenditure per capita. In addition, the amount of educational expenditure is not sufficient to improve educational access. It also depends on how the local government utilizes the education expenditure, which is related to the human capacity available at the local government level to improve the quality of education service. An improvement in education service in its turn will attract more people to lengthen their schooling (Kaiser, 2006).

4.9.2 Unexpected findings, limitations and avenues for future research

Two unexpected findings deserve further discussion. First, we conclude that the progress of change decreased after decentralization. Why this progress is slower after decentralization can be explained by Bardhan's adapted theory of decentralization for developing countries (2002). Firstly, centralization can create economies of scale with regard to overhead and facilities. For example, a centralized system can be more economically efficient in purchasing materials for building a large number of new schools as a method to provide more access to education. Secondly, decentralization implicitly assumes that allocated funds automatically reach the beneficiaries. This assumption needs to be qualified with the spending quality and the capacity of public bureaucrats at

the local level. Third, a World Bank's study (2008) exposed that although the share of municipalities on the total education budget is dominant, the majority of these expenditures is for routine spending, such as personal expenses (75.2%). Therefore, although municipalities spend a substantial share of expenditures in the education sector, they actually have very little fiscal autonomy for expenditures to implement context-specific programs. Finally, progress of length of schooling becomes more difficult to improve when the schooling has already been achieved to a substantial level.

Second, our findings also reveal that decentralization increased the variability in the mean length of schooling between municipalities, but not among the provinces. These findings could be elucidated by Nordholt's argument (2003) that decentralization in Indonesia bestowed power and authority from the central government to the municipal level as an autonomous entity. Consequently, the roles of provinces are limited especially in the education sector because the primary and secondary school are directly managed by the municipalities. Moreover, local government autonomy enabled the municipality to tailor their program to accelerate education attainment. However, the municipalities are diverse in terms of resources and constraints, which enlarged the variations in improving educational service (Kaiser, 2006). For instance, some municipalities received substantial revenue, such as revenue sharing from oil, mining and several local taxes, while other municipalities did not have such additional income. Moreover, in terms of governance, the varied capacities of the local governments had consequences for the effectiveness of the implementation of a context-specific educational program. As a result, some municipalities benefitted more from decentralization while others were not able to benefit optimally from decentralization (Galiani & Schargrodsky, 2002).

Finally, a number of limitations to this study and avenues for future research deserve further discussion. Firstly, due to the nature of our data at the municipal and provincial level which were constructed from individual survey data from different years, these findings do not reveal the micro level pattern. An avenue for research would be to conduct analyses at the micro level, such as household and individual levels to disentangle a comprehensive portrait of the impact of education decentralization. Secondly, the new municipalities and new provinces data before decentralization are proxies because those municipalities and provinces were still part of other municipalities and provinces during the centralization era. Future studies could employ more fine-grained measures of the data for newly created local governments, both municipalities, and provinces. Third, other contextual aspects such as education expenditure could be examined to determine in more detail the configuration of constraints and opportunities regarding educational access. Finally, future work might also take on a two-sided perspective on government supply and people demand of education and their simultaneous interaction.

Despite these limitations, the current study presents new results and draws a comprehensive picture of educational attainment in Indonesia at both the municipal and the provincial level. Our results show similarities as well as differences between the eras

of centralization and decentralization with democratization that might be useful for further improving Indonesia's decentralization policy. One consideration based on our analysis is how to define the role of the central, provincial, and municipal levels within the multilevel system in handling educational service delivery with the aim of reducing regional discrepancies. This critical issue relates to the question how the central government can define better interventions, both in the domains of finance and technical assistance, to reduce these regional disparities. Our study seems to indicate that the central government's interventions need to be prioritized to predominantly rural area and less developed municipalities.

5

Organizational and ideological differences between private Islamic schools in Indonesia and their effects on student achievement and the achievement gap[10]

Abstract

The expansion of private secondary schools in Indonesia is a double-edged sword, particularly when inequality is high on the development agenda. On the one hand, private secondary schools are becoming more important providers and are thus important in improving access to education. On the other hand, the quality of private schools is lower than that of public schools. In our study, one of the first to examine the effects of different types of private Islamic schools on student achievement and achievement gaps, we develop a typology of Indonesian private Islamic schools, divided along track and stream. We formulate hypotheses, drawing on an education production function approach that outlines differences in investment and resource allocation decisions across these tracks and streams. We contend that devoting more time, money and attention to students will lead to greater numbers of students learning, and to higher student performance and smaller achievement gaps. We tested our hypotheses using Indonesian data collected in 2013 on 156,952 students nested in 3,150 schools in 366 municipalities. Using multilevel regression analyses, we found that student achievement and achievement gaps vary over private Islamic school tracks and streams. Even though student achievement and achievement gaps are strongly determined by student and family characteristics, our findings suggest that differences between school tracks and streams also play an important role. Moreover, our study revealed a large variability in student achievement and achievement gaps between municipalities.

[10] This chapter is co-authored with Rafael Wittek, Liesbet Heyse and Marijtje van Duijn and is currently under review at an international peer-review journal.

5.1 Introduction

The number of private secondary schools in Indonesia is growing. Almost 60 percent of Indonesian secondary schools are private in nature, as are more than half of junior secondary schools and almost 70 percent of senior secondary schools (Bappenas, 2015). Private secondary schools are thus becoming more important education service providers in Indonesia.

Within the group of private secondary schools, more than 90 percent are Islamic in nature, meaning that there is explicit attention to the spirit of Islam in the curriculum (calculated from the MoEC, 2013). Private Islamic schools are argued to be popular because they are less expensive and have a higher level of religious instruction than public schools (Woodward, Rohmaniyah, Amin, & Coleman, 2010). This is illustrated by the fact that in Indonesia the number of private madrasah schools (a particular kind of private Islamic school) annually increases by an average of 3.9 percent while the average growth of public schools is only 1.5 percent (USAID, 2007).

However, students' achievement in Indonesian private schools is lower than students' achievement in public schools. For example, Newhouse and Beegle (2006) examined the impact of school type on the academic achievement of junior secondary school students in Indonesia. After controlling for a variety of other characteristics, the conclusion was that private school students' scores in the national exam were 0.15 to 0.3 standard deviations lower than those of their comparable public school peers. These lower students' scores are puzzling as well as challenging because of their potential negative impact on student achievement in general.

Studies on differences in student achievement focus predominantly on the difference between public and private schools (*e.g.* Bernando *et al.*, 2015; Braun *et al.*, 2006). Interestingly, there is little attention to differences *between* private schools in general, and between Islamic private schools in particular, even though these differences are quite pronounced and might matter for explaining differences in student achievement, as we will later argue. This study therefore asks whether and how differences between private Islamic schools in Indonesia affect student achievement as well as achievement gaps for boys and girls, and for groups of different social economic status (SES).

Though inequalities have decreased during the past years, the achievement gap across SES and gender in Indonesia is still large (Tobias, Wales, Syamsulhakim, & Suharti, 2014; World Bank, 2013). Our study defines the achievement gap as: the observed differences in student achievement, measured by cognitive test scores between groups of students, especially groups defined by socioeconomic status (SES) and gender (Reardon, 2011; Kafir, 2007). Seminal studies examined achievement gaps across SES and gender, also in the Indonesian context. For instance, high SES is linked to higher student achievement (Suharti, 2013). According to the OECD international benchmark with a 1000-point scale, the average scores of students from families in the bottom

income quintile are 350 in mathematics and 400 in reading (Tobias *et al.,* 2014; World Bank, 2013) whereas average scores of their peers in the top income quintile are 390 and 420, respectively (Tobias *et al.,* 2014). Interestingly, in Indonesia, girls perform better than boys in all subjects (Suharti, 2013; Suryadarma, 2010). However, there is no study that examines the possible effects of differences between various types of Islamic private schools on student achievement and the student achievement gaps across SES and gender in Indonesia.

This paper identifies two key differences in private Islamic schools in Indonesia that might affect student achievement and achievement gaps. First, there are ideological differences relating to how private Islamic education providers interpret their religion in the Indonesian social and educational context. These ideological differences are reflected in three *streams* in Indonesian private Islamic schools, which we will elaborate in the remainder of this paper: Traditionalists, Modernists and Integrationists (Ishomudin, 2014; Bryner, 2013; Hassan, 2009). Second*,* there are organizational differences related to the role of the government in managing private Islamic schools. Here the distinction between madrasah and non-madrasah is relevant, resulting in two *tracks* in private Islamic schools. Non-madrasah private Islamic schools are coordinated by the Ministry of Education and Cultre (MoEC), whereas madrasah private Islamic schools are managed by the Ministry of Religious Affairs (MoRA).

Based on the above two distinctions, this paper identifies six types of private Islamic schools: (1) Traditional madrasah; (2) Traditional non-madrasah; (3) Modernist madrasah; (4) Modernist non-madrasah; (5) Integrationist madrasah; and (6) Integrationist non-madrasah. More specifically, this paper addresses the question: *How do various tracks and streams in Indonesian Islamic private schools affect students' academic achievements and achievement gaps across gender and parental SES?*

We base the answer to our research question on an education production function approach, which assumes that student achievement is a function of a school's investment in teaching-related activities and resources (Hanushek, 2007; Coates, 2003; Bowles, 1970). Hence the amount of time, money and attention devoted to students will affect how much they learn, as well as their performance and the gaps in their achievements. Using this point of departure, we reason that the above-mentioned ideological and organizational differences between Islamic private schools have consequences for investment and resource allocation decisions within the six different types of schools.

We specify our theoretical expectations by distinguishing four dimensions of investments: (1) investments in the primary process, such as the amount of time spent on teaching and the amount of emphasis on particular subjects; (2) investments in teachers, including selection of high quality teachers and improving teachers by training; (3) investments in students by financially supporting poorer students and implementing single sex classrooms; and (4) investments in organization and coordination. We categorize the six types of private Islamic schools with regard to these investment dimensions and analyze which school type makes most investments and thus can be

expected to have better student achievements and smaller achievement gaps. Multilevel regression analyses (*e.g*. Snijders and Bosker, 2012) are used to test to what degree the six types of private Islamic schools, and the associated differences in investments and resource allocation decisions, affect student achievement and the achievement gap in Indonesia. The focus is on junior secondary schools in 2013.

Our study enriches the current literature in at least three respects. First, this is to our knowledge the first quantitative study that systematically compares differences *within* the Islamic private school sector in Indonesia, the country with the highest Muslim population in the world. While several systematic reviews on track and stream differences between private Islamic schools in Indonesia have been undertaken (see *e.g*. Ishomudin, 2014; Barton, 2014; Hassan, 2009), none directly tested the relation between these differences and student achievement and achievement gaps in terms of gender and parental SES. Second, by testing the education production function construct in relation to track and stream differences between various types of Islamic private schools in Indonesia, we enrich the literature that deals with how investment and resource allocation differences between schools affect student achievement. Third, by offering a more fine-grained understanding of the effect of organizational and ideological differences in private Islamic schools this study may contribute to the development of policy recommendations aimed at strengthening the Indonesian national education system (Kingham & Parsons, 2013).

The next section describes Indonesia's school system. Section 3 sketches our theoretical framework and derives testable hypotheses. Then it follows an explanation of our data, method and results. We conclude with a discussion of policy recommendations and avenues for future research.

5.2 Organizational and ideological differences in private Islamic school

The school system in Indonesia consists of nine years of compulsory basic education, combining six years of primary school (grades 1-6) and three years of junior secondary school (grades 7-9). After completing their basic education, students follow three years of senior secondary school (grades 10-12).

As stated previously, schools in Indonesia are either private or public. Within the private education sector, most schools are Islamic. Islamic private schools can be under management of the MoRA or the MoEC, resulting in two possible private Islamic school tracks: *madrasah versus non-madrasah*. Next to this organizational difference, private Islamic schools also differ ideologically. This is reflected in the presence of three streams in private Islamic education, which are coordinated and run by three large non-governmental Muslim organizations that play an important role in the delivery of educational services: *a Modernist stream, a Traditionalist stream and an Integrationist stream* (USAID, 2007; Hasan, 2009).

The *modernist* stream is run by Muhammadiyah, Indonesia's oldest Muslim mass organization. It was established in 1912 in Yogyakarta based on the principles of modernist and moderate Islam (Suharto, 2014). It is called *modernist* because it rejects local customs in favor of the universal practices of modern Islam (Palmier, 1954). For instance, it initially established modern schools replicating Dutch schools by implementing graded classes with a curriculum of secular subjects by including religious education (Burhani, 2005). Currently, it is the largest private education provider, running 4,623 preschools and 5,691 educational institutions from primary to higher education[11].

The *traditionalist* stream, called Nahdatul Ulama (NU), which means the awakening of Islamic scholars, has played a significant role in the provision of education in Indonesia since the late colonial era (USAID, 2007). NU is the largest Muslim mass organization in the country and was established on 31 January 1926 in Surabaya. It is called *traditionalist* because it emphasizes the traditional meaning of Islam in the Indonesian context. It manages and coordinates about 6.000 educational institutions from preschools to universities and colleges.[12]

The *integrationist* stream is the third stream. This stream is represented by the network of Integrated Islamic schools (*Jaringan Sekolah Islam Terpadu*/JSIT), a fairly new consortium that was established on 31 July 2003 in Yogyakarta. Integrationist schools offer an integrated secular curriculum within an Islamic moral framework (Bryner, 2013). They integrate general and religious subjects by incorporating religious values in almost all subjects. Currently, the JSIT consortium includes 1,926 member schools and more than 500 affiliated schools (interview with Chairman JSIT, 16/12/2015).

While the Modernist movement is primarily a social welfare organization devoted to serving the community in education and healthcare and is characterized by egalitarian and non-hierarchical relations (Palmer & Burgess, 2012; Thachil, 2014), the Traditionalists are dedicated to protecting the interests of clerical elites (Thachil, 2014; Millie, 2013). The new- comers, the Integrationists, resemble the Traditionalists with their focus on clerical elites; however, this is combined with a modern agenda that is slightly similar to that of the Modernist movement (Hasan, 2009).

Based on the above-mentioned ideological and organizational differences we can distinguish six types of private Islamic schools: (1) Traditionalist non-madrasah; (2) Traditionalist madrasah; (3) Modernist non-madrasah; (4) Modernist madrasah; (5) Integrationist non-madrasah; (6) Integrationist madrasah.

[11] Data available at http://www.muhammadiyah.or.id/content-8-det-amal-usaha.html

[12] Available at http://www.maarif-nu.or.id/Profil.aspx

5.3 Theory

In order to answer the research question of how the various private Islamic school tracks and streams affect student achievements and achievement gaps, we use an input-based or "production function" approach. This assumes that student achievement is a function of the school's investments in activities and resources related to teaching, like time for instruction (Hanushek, 2007): the higher these investments, the more students will learn, and the better they will perform (Coates, 2003). Our study uses the typology of school tracks and streams to assess variations in such investments, and relates them to achievement of individual students as output (Hanushek, 2007; Bowles, 1970).

Hanushek (2007) distinguished two inputs that significantly contribute to student achievement: investments directly controlled by policy makers, such as teachers, and inputs not controlled by policy makers, such as those provided by families (e.g. parental education and income). Most research focuses on inputs like school resources, such as the effects of teacher qualification and experience, or financial resources, on student achievement (Hanushek, 2007).

Next to schools and families, there is another level of input. These are investments that are partly determined by the individual schools but also by the streams, as represented by the three Muslim umbrella organizations. This includes, for example, the choice of whether to have boys and girls together in the classroom, or decisions about how much time is spent on religious education next to the examination subjects. Beside the stream, schools also are divided by two tracks, madrasah versus non-madrasah. This track relates to government policy, which also influences the schools' investment and in turn affects student achievement. For instance, in the US, the way state governments provide sources of funding and regulate rules for certification affects student achievement (Hanushek, 2007). Likewise, the central and local governments in Indonesia play a very crucial role in educational policy and practice.

Adopting Hanushek's classification of inputs and organizational approaches, we distinguish four dimensions of school investments: (1) investments in the primary process, such as how much time is spent on teaching and whether particular subjects receive more attention than others (Coates, 2003); (2) investments in teachers, including selecting high quality teachers and training teachers; (3) investments in students by financially supporting poorer students and implementing single sex classrooms; and (4) investments in organization and coordination.

Our main argument is that tracks and streams of Indonesian private Islamic schools differ in their decisions with regard to these four types of investment. Consequently, we expect that they also are the primary factor explaining between-school variations in student achievement and gender and SES achievement gaps.

5.3.1 School track differences and student achievement

If we look at *investments in the primary process*, all Islamic private schools, both madrasahs and non-madrasahs, follow the national curriculum. However, madrasahs teach a core curriculum of general subjects supplemented by an additional 30 percent of religious education subjects (*SKB Tiga Menteri* No. 6/1975). In non-madrasah schools, there is less attention to religious subjects. Consequently, students in non-madrasah schools spend more time on National Examination subjects. More teaching significantly enhances student performance (Stinebrickner & Stinebrickner, 2008), especially in mathematics and science (Grave, 2010). Consequently, we expect student achievement in madrasahs to be lower than in non-madrasahs.

In terms of *investments in teachers*, the Ministry of Education and Culture (MoEC), as well as local governments, facilitate both public and private non-madrasah teachers to enhance their professional skills and qualifications (USAID, 2007). The Ministry of Religious Affairs (MoRA) fully supports public madrasah schools, but does not provide as much funding and training for private madrasahs (Kingham & Parsons, 2013).

Moreover, Law 14/2005 concerning Teachers and University Lecturers states that all teachers at the junior secondary level must have a four-year post-secondary diploma or a bachelor's degree in the relevant subject. The fulfillment of this teachers' qualification in non-madrasah schools is higher, with 61 percent as compared with 55 percent of teachers meeting this qualification in madrasahs; this means that almost 45 percent of madrasah teachers do not have a four-year post-secondary diploma (USAID, 2007). Teacher development and qualification may influence subject matter knowledge and pedagogical skills, which in turn may bolster or undermine teacher performance and student achievement (Darling-Hammond, 2000). Consequently, lower teacher qualifications are assumed to be related to lower teacher performance and lower quality of learning in madrasahs (Kingham & Parsons, 2013).

Concerning *investments in students*, private Islamic madrasahs invest less in their students than private Islamic non-madrasahs, with an average annual cost per pupil of IDR 9,706,000 (US$970,6) compared to IDR 10,930,000 (US$1,093) in their non-madrasah counterparts. In addition, parents of students in Islamic private non-madrasah schools contribute a higher proportion to learning budgets than their counterparts in madrasahs (USAID, 2007). The more money a school has, the better the teaching can be, and the better the achievement (Hanushek & Raymond, 2005).

In terms of *investments in organization and coordination*, while madrasahs are centrally managed by the MoRA, non-madrasahs are decentralized from the MoEC to the municipalities (Permani, 2009). This means that non-madrasahs are able to focus more on local conditions and government arrangements, whereas madrasahs also need to coordinate with the central government. Such coordination may divert money to bureaucracy, decreasing a school's investment in teaching, which in turn may negatively

affect student performance (ACDP, 2013). Conversely, decentralization has a positive impact on teachers' working environments because it enables teachers to connect and share their motivation and skills (Louis, Dretzke, & Wahlstrom, 2010). Competent and motivated teachers improve the quality of teaching and learning and thus advance student achievement (Darling-Hammond, 2000). Therefore, we expect the centralized system of madrasahs to have a negative impact on student achievement.

Overall, due to their focus on religious subjects, private madrasah schools in Indonesia – as compared to private non-madrasah schools – devote fewer hours to teaching on the national curriculum. Furthermore, investments in teachers and students and the quality of teachers are lower. Madrasahs also receive fewer parental monetary contributions and need to divert resources into coordination tasks. All these factors are expected to affect students' learning and achievement. Based on these arguments, we expect that *students who attend private madrasah schools will have a lower level of achievement than students who attend private non-madrasah* schools (H1).

5.3.2 School streams differences and student achievement

With regard to *investments in the primary process*, the integrationists teach more hours, with 35 hours a week, compared to the traditionalists and the modernists, who each teach 30 hours. Teaching time is more productive than time spent on self-study (Dolton, Marcenaro, & Navarro, 2003) and more teaching time has been found to improve students' performance (Stinebrickner & Stinebrickner, 2008), particularly in mathematics and science (Grave, 2010).

In addition, the integrationists pay extra attention to the national exam subjects, especially to English, mathematics and science, whereas the traditionalists and the modernists do not (Hasan, 2009). Integrationists also teach religious subjects, but only as an extracurricular activity. This extra attention to national exam subjects helps to advance the understanding of the students in those specific subjects to be tested. This can be expected to lead to an increase in their test scores.

In terms of *investments in teachers*, as mentioned above, the law requires that all teachers at the junior secondary level must have a four-year post-secondary diploma or a bachelor's degree in the relevant subject. Fulfillment of this qualification in the integrationist stream is higher (76%) than in the traditionalist (71%) and modernist (70%) schools (MoEC, 2010), resulting in slight variations in knowledge and pedagogical skills, which might contribute to the variation in achievements across streams (Darling-Hammond, 2000).

Likewise, in the integrationist stream school personnel and teachers spend more time mainly to implement the full-day school system. This means that schools have to pay additional salary for overtime teaching by their teachers, leading to a general increase in school costs. Because private school operation costs rely mainly on parental

contributions, they increase school fees to cover their operational costs (USAID, 2007). For instance, the average integrationist tuition fee is IDR 1,973,000 ($197) per student per year while the average tuition fee in the modernist and traditionalist streams is IDR 983,000 ($98) and IDR 676,000 ($67), respectively (calculated from MoEC, 2010). These additional investments in teaching time may improve student achievement (Hanushek, 2006).

Overall, the integrationist schools devote more teaching time and provide extra attention to national exam subjects. Additionally, they also invest more in teachers' development and qualification, and have greater budgets for teaching. These arguments lead us to predict that *students in integrationist streams will attain higher academic achievement than those in modernist and traditionalist streams* (H2).

5.3.3 The gender achievement gap across school tracks and streams

Gender differences in student achievement have been subject of extensive study and debate (Stoet & Geary, 2013; Suryadarma, 2010; Machin & Pekkarinen, 2008). There are stereotypes that girls are superior in reading skills but inferior in mathematics skills. Findings from the United States on eighth graders, for instance, confirm that girls consistently had lower mathematics scores but higher scores in reading (Stoet & Geary, 2013; Machin & Pekkarinen, 2008). Similarly, a cross-country study in 2003 using data from PISA among 15-year-old students showed that girls performed better in reading while boys performed better in mathematics (Machin & Pekkarinen, 2008). However, findings from Indonesia reveal that girls perform better than boys in numeracy (Suryadarma, 2010). Suryadarma (2010) argues that the girls' superiority in numeracy can be explained because there is a higher labor market return for female-led families to invest more resources in girls. It is also because teachers are mainly females, which may stimulate girls to perform better and lead to increased female achievement (Suryadarma, 2010).

In relation to the gender achievement gap, an important difference between the various types of private Islamic schools is the choice to implement single sex education (SSE). Compared to non-madrasahs, in terms of teaching and learning rules, madrasahs tend to be stricter (Woodward, 2015). They also have a tradition of single sex education (SSE), which has been found to make girls freer and more competitive (Woodward 2015). The same holds for integrationist schools: they also implement single sex education, which can minimize distractions and reduce discipline problems (Gurian & Henley, 2001). Although the standards of discipline in a single sex environment (Jeffrey, Jeffery, & Jeffery, 2008) are similar, girls tend to be more closely supervised than boys (Parker & Raihani, 2009), which may enable girls to focus more on learning than when they are in a mixed class. In addition, single sex education has been shown to benefit girls because it

boosts their self-esteem and confidence (Bracey, 2006), which is linked to educational achievement (Piper, 2008; March, Byrne & Yeung, 1999).

Based on these arguments related to single sex education, we assume that in the madrasah track and the integrationist stream, girls will perform better than boys, reinforcing the gender achievement gap in both the madrasah track and the integrationist stream, compared to the non-madrasah track, the traditionalist and the modernist streams. Overall, girls attending madrasah and integrationist schools are expected to profit more from implementation of single sex education than are boys. In these school types this is expected to widen the gender gap in favor of the girls. We thus predict that *gender based achievement gaps in private madrasahs are greater than in private non-madrasah (H3a) and that gender-based achievement gaps in the integrationist stream are greater than in traditionalist and modernist streams (H3b).*

5.3.4 The SES achievement gap across school tracks and streams

Unlike madrasahs that are centrally managed by the Ministry of Religious Affairs (MoRA), non-madrasahs are decentralized and fall under the Ministry of Education and Culture (MoEC) and local governments (Permani, 2009). This has consequences for investments in education, since non-madrasahs have more resources than madrasah because they receive investments from both the central and local governments.

Since the non-madrasah schools have more resources they can provide more financial support to low SES students. For instance, scholarships for low SES students are more adequate in non-madrasahs than in madrasahs because, as mentioned above, non-madrasahs have at least two sources of resources, namely the MoEC and the district education office (USAID, 2007). Financial support via scholarships for low SES students could prevent them from leaving school for a temporary job, such as harvesting. This can improve the attendance of low SES students, which may advance their learning; this would reduce the SES achievement gap more in non-madrasah schools than in madrasah schools. Moreover, although the MoRA fully supports public madrasahs, it does not provide sufficient scholarships to private madrasahs (Kingham & Parsons, 2013). This could make it difficult for private madrasahs to boost the motivation and opportunity of low SES students to heighten their achievements.

In addition, although there are contradicting opinions as to the effect of decentralization in the education sector (e.g. Devins, 1987), in the Indonesian context decentralization has influenced local governments to respond better to local needs for educational services (Sumarto, Suryahadi, & Arifianto, 2004; UNDP, 2002; Usman, 2001). When decentralization leads local governments to respond to the local people's needs and people's aspirations for children's education are high, the municipality may invest more in education. This investment leads to improved learning environments and

may equalize the performance of low SES students in non-madrasahs. Thus, it can lead to improved educational outcomes (Simatupang, 2009).

With regard to financial or other support for low SES pupils, unlike integrationist schools, traditionalist and modernist schools financially support low SES students. Both traditionalist and modernist schools collect Islamic alms (*zakat*) and donations from their members (Burhanudin, 2015). These financial resources are partly distributed amongst low SES students. This may increase the daily school attendance of low SES students and in this way improve their learning and performance, in turn reducing the advantage of the high SES students over low SES students and thus the SES achievement gap in modernist and traditionalist schools becomes smaller.

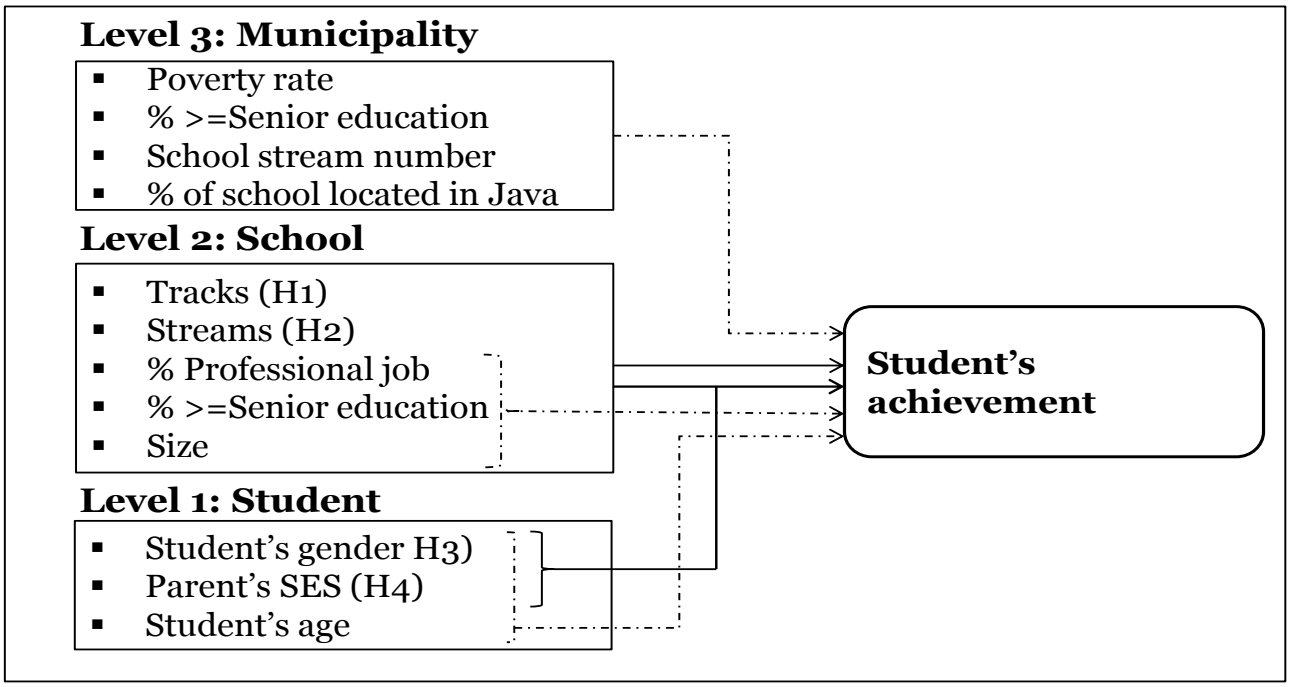
Based on these reasons, we predict that *the SES achievement gap in private madrasahs is greater than in private non-madrasahs (H4a) and the SES achievement gap in the integrationist stream is greater than the gaps in both the traditionalist and modernist streams (H4b).*

5.3.5 Context variables

In the educational production function approach, family backgrounds are important determinants of student achievements (Grave, 2010). Generally, highly educated parents and certain professional occupations, such as public servants and private workers, are associated with high expectations towards education. These groups of parents have a better capacity to support and motivate their children, which may improve their school performance as compared to peers from low-educated parents with unskilled occupations. Also in the Indonesian context, parental education and occupation are still determinant factors in student achievement (Suharti, 2013). We therefore include parents' educational background and occupation in our analyses.

Furthermore, as reviewed by Hanushek (2007), school characteristics and municipality factors need to be included as inputs in the education production function. At the school level, this paper takes into account the average school test score, the average student age, the proportion of female students, the school size, the proportion of parents with a professional occupation and a high educational background. At the municipality level, we also include the average scores on this level, as well as the average of students' age, proportion of females, school size, proportion of parents with a professional occupation and high educational background, poverty rate, and the average number and proportion of schools located on Java Island. Figure 5.1 illustrates our conceptual framework.

Figure 5.1 The effect of school stream and track on achievement and achievement gap



Context variables: average student age and proportion of females at the school-level; and at municipality-level: average student age, average school size, proportion of females, proportion of professional parents

5.4 Data and methods

5.4.1 Data collection

We mainly used the National Examination dataset of junior secondary education from the MoEC (2013). It consists of data of 3,671,863 students nested in 48,962 schools, both public and private, and madrasah and non-madrasah. The dataset consists of national examination scores on four subjects: Indonesian language, mathematics, science and English. Since the variation on the Indonesian language score is low (1.89), this study focuses on mathematics (4.31), science (3.12) and English (2.90).

The dataset also includes student age, gender and parent's education and occupation for each school. The junior secondary schools in the dataset are divided into three categories: *madrasah tsanawiyah*, junior secondary school and open junior secondary school, the latter two representing our non-madrasah category. We combined junior secondary school and open junior secondary school into a non-madrasah school category because the numbers of these schools are very small and exist only in the modernist stream.

To categorize the various schools according to the three streams of private Islamic schools, we consulted with and interviewed a number of experts in three rounds, i.e. the chairperson or vice chairperson of the modernist, the traditionalist and the integrationist umbrella organizations. First, based on an initial consultation and interview, we selected data from all private non-madrasahs as well as madrasahs from the MoEC dataset and coded "1" for *Traditionalist*, "2" for *Modernist*, "3" for *Integrationist* and "4 for other, which could be traditionalist, modernist or integrationist if the identity could not be verified. This category consists of 39.4 percent of all schools in the dataset (16,436).

Second, using the selected data of the three streams of Islamic schools, we again consulted the chairperson or vice chairperson of each umbrella organization. They partially confirmed the first school list and provided an additional school list to be checked with the MoEC dataset. Based on this data confirmation, we included additional school information calculated from *Data Pokok Pendidikan* (Dapodik) 2010 and linked this to the MoEC dataset 2013. Finally, we sent the new selected school data to the chair or vice chair of the organizations for a final reliability check.

The modernist and traditionalist informants confirmed that the new school data sets were correct but the integrationist informant proposed dropping some madrasahs in the dataset because they were not part of the integrationist madrasahs. Based on this confirmation, we constructed the final dataset consisting of 156,952 students nested in 3,150 schools. Those students are distributed over three school streams: 47.2 percent in *the traditionalist*, 47.0 percent in *the modernist*, and 5.8 percent in *the integrationist* institutions.

Furthermore, three experts (Vice Chairman of Primary and Secondary Education Council of Muhammadiyah/*Modernist*; Vice Chairman of LP Maarif NU/*Traditionalist*, and the Chairman of JSIT/*Integrationist*) were approached to elicit background information about each stream's unique features as indicated by their vision and mission and how the schools incorporate the national curriculum, as well as issues such as the number of teaching hours, teacher training, teaching qualification, extra attention for specific subjects, investments in coordination, financial or other support for low SES pupils, and implementation of single sex classes.

5.4.2 Data description

The dataset is described in terms of variables and levels (student/family, school and municipality). Summaries of the variables (means, standard deviations and proportions) and distributions over the school tracks and streams are given in Table 5.1, at all three levels; of these the most important findings are mentioned in the text.

Table 5.1 Descriptive statistics at student, school and municipality-level variables

Variables	Overall	Traditionalist		Modernist		Integrationist	
		Madrasah	School	Madrasah	School	Madrasah	School
Student-level (N=156,952)	μ (SD)	n=50,618 (32,3%)	n=23,540 (15%)	n=18,188 (11,6%)	n=55,547 (35,4%)	n=375 (.2%)	n=8,684 (5.5%)
1. Math score	5.55 (2.12)	5.74 (2.06)	5.66 (2.21)	5.39 (2.07)	5.28 (2.09)	6.34 (2.05)	6.26 (2.17)
2. Science score	5.79 (1.83)	5.95 (1.82)	5.93 (1.99)	5.67 (1.74)	5.53 (1.78)	6.20 (1.45)	6.31 (1.67)
3. English score	5.45 (1.70)	5.52 (1.65)	5.46 (1.76)	5.31 (1.63)	5.28 (1.68)	6.39 (1.44)	6.36 (1.71)
4. Student age	15.56 (0.85)	15.58 (0.84)	15.63 (0.86)	15.57 (0.87)	15.55 (0.86)	15.17 (0.57)	15.23 (0.62)
5. Student gender *(1=female)*		.51	.47	.50	.46	.45	.49
6. Parent education:							
(0) Unknown	25.20%	27.7%	18.4%	22.7%	26.6%	7.2%	25.8%
(1) Primary or below	34.40%	43.6%	44.1%	36.8%	25.6%	1.1%	6.8%
(2) Junior secondary	16.10%	15.5%	17.0%	18.6%	17.0%	1.6%	7.2%
(3) Senior secondary	17.50%	10.9%	16.2%	17.0%	23.0%	22.4%	25.4%
(4) Higher education	6.80%	2.3%	4.2%	4.8%	7.7%	67.7%	34.7%
7. Parent job:							
(0) Unknown	23.00%	25.1%	16.0%	21.4%	24.7%	4.8%	23.0%
(1) Farmer/worker	36.10%	41.3%	39.8%	43.8%	31.0%	.3%	12.9%
(2) Civil servant/professional	5.30%	3.2%	3.4%	5.4%	5.7%	40.0%	17.4%
(3) Private workers	12.00%	9.4%	13.9%	7.5%	13.1%	21.3%	23.4%
(4) Self-employed	17.50%	15.1%	19.8%	15.6%	19.1%	25.6%	18.5%
(5) Other	6.20%	5.8%	7.1%	6.2%	6.4%	8.0%	4.8%

Sources: *National exam 2013, Ministry of Education and Culture; Susenas 2010, Central Bureau Statistics (CBS).*

Table 5.1 Descriptive statistics at student, school and municipality-level variables **(Continued)**.

Variables	Overall	Traditionalist		Modernist		Integrationist	
		Madrasah	School	Madrasah	School	Madrasah	School
School-level (N=3,150)		n=924 (29.3%)	n=456 (14.5%)	n=502 (15.9%)	n=1,087 (34.5%)	n=3 (0.1%)	n=178 (5.7%)
1. Math score average	2.33 - 9.90	5.90 (1.65)	5.90 (1.83)	5.53 (1.71)	5.28 (.160)	5.68 (1.13)	5.85 (1.45)
2. Science score	3.14 - 9.63	6.11 (1.44)	6.15 (1.60)	5.79 (1.45)	5.54 (1.36)	5.96 (0.86)	6.03 (1.11)
3. English score	2.71 - 9.24	5.64 (1.24)	5.63 (1.36)	5.38 (1.27)	5.22 (1.17)	6.15 (1.01)	6.01 (1.12)
4. Proportion of senior/higher education *parents*	0 - 1	0.03 (0.09)	0.03 (0.10)	0.05 (0.12)	0.05 (0.09)	0.41 (0.42)	0.03 (0.09)
5. Proportion of professional parents	0 - 1	0.12 (0.17)	0.17 (0.21)	0.21 (0.24)	0.26 (0.26)	0.65 (0.56)	0.15 (0.18)
6. Average age	14.0 - 18.9	15.64 (0.33)	15.73 (0.42)	15.61 (0.37)	15.64 (0.35)	15.24 (0.38)	15.29 (0.32)
7. Proportion of females	0 - 1	0.49 (0.13)	0.46 (0.14)	0.49 (0.15)	0.45 (0.13)	0.52 (0.09)	0.46 (0.14)
8a. School size	1 - 476	58.44 (49.56)	55.09 (54.77)	38.62 (28.60)	54.53 (47.52)	133.67 (203.83)	52.01 (46.31)
8b. School size (*categorical*)							
1. Smallest [<20]	20.4%	15.9%	21.1%	24.7%	21.7%	66.7%	20.8%
2. Small [=>20]	27.7%	27.1%	25.9%	36.1%	25.3%	0.0%	28.1%
3. Medium [>36 and <108]	41.4%	44.3%	41.7%	36.1%	41.8%	0.0%	38.8%
4. Large [=>108 and <325]	10.3%	12.7%	10.7%	3.2%	11.1%	0.0%	12.4%
5. Largest [>=325]	.2%	.1%	.7%	0.0%	.1%	33.3%	0.0%
Municipality-level (N=366)		n=22 (6%)	n=39.1 (10.7%)	n=30 (8.2%)	n=244.9 (66.9%)	n=0 (0%)	n=30 (8.2%)
1. Math score average	3.04 - 9.78	5.88 (1.45)	5.43 (1.52)	5.48 (1.57)	5.39 (1.52)	5.68 (1.13)	6.00 (1.36)
2. Science score	3.45 - 8.98	6.00 (1.26)	5.47 (1.37)	5.71 (1.33)	5.58 (1.25)	5.96 (0.86)	6.11 (1.04)
3. English score	3.43 - 8.54	5.59 (1.12)	5.33 (1.17)	5.37 (1.17)	5.27 (1.16)	6.15 (1.01)	6.08 (1.03)
4. Average age	14.9 - 17.2	15.67 (0.29)	15.72 (0.29)	15.61 (0.32)	15.64 (0.34)	15.24 (0.38)	15.28 (0.27)
5. School size	3 - 164.5	47.08 (33.75)	50.17 (40.07)	37.28 (22.13)	48.64 (35.90)	133.67 (203.83)	54.29 (46.26)
6. Proportion of female	0 - 0.84	0.49 (0.12)	0.46 (0.12)	0.49 (0.11)	0.45 (0.11)	0.52 (0.09)	0.48 (0.12)
7. Poverty rate	0.02 - 0.48	0.14 (0.12)	0.14 (0.07)	0.14 (0.06)	0.13 (0.06)	0.14 (0.09)	0.12 (0.06)
8. Proportion of senior edu. parent	0 - 1	0.14 (0.16)	0.17 (0.21)	0.25 (0.26)	0.27 (0.23)	0.65 (0.56)	0.50 (0.40)
9. Proportion of professional parent	0 - 1	0.03 (0.09)	0.04 (0.11)	0.05 (0.10)	0.06 (0.09)	0.41 (0.42)	0.15 (0.17)
10. Average number of school	1 - 47	5.47 (7.92)	3.93 (5.32)	2.95 (3.42)	3.58 (4.30)	1.00 (0.00)	1.80 (1.57)
11. Java versus non-Java	0 - 1	0.81 (0.39)	0.87 (0.34)	0.50 (0.50)	0.61 (0.49)	0.670 (0.58)	0.59 (0.49)

Sources: *National exam 2013, Ministry of Education and Culture; Susenas 2010, Central Bureau Statistics (CBS).*

5.4.3 Variables

Student/family

National examination (NE) scores. NE results on mathematics, science and English are scored from 0 to 10.

Age. In years. Students are mostly 15 years old when taking the exams, with ages ranging from 14 to 28. We use centered age for the analysis, meaning that a value within the age is equal to zero.

Parental education. Five categories are distinguished: "1" for primary education or lower (34.4%), "2" for junior secondary education (16.1%), "3" for senior secondary education (17.5%), and "4" for higher education (6.8%). If parental educational level was unknown, it was coded "0".

Parental occupation. Six categories are distinguished: "1" for farmer/worker (36.0%), "2" for civil servant/professional (5.3%), "3" for private worker (12.0%), "4" for self-employed (17.5%), and "5" for other (6.2%). If parent's occupation was unknown, it was coded "0".

School

Size. In number of students. School size ranges from 1 to 476, with an average of 53.

School size category. Based on the MoEC standard of class and school, five categories are distinguished: "1" for <20; "2" for =>20 and <36; "3" for >36 and <108; "4" for =>108 and =<325; "5" for >325.

Average age. Computed as the mean student age, ranging from 14 to 18.9.

Proportion of female students. Ranges from 0 to 0.84.

Proportion of well-educated parents. Computed as the number of parents with senior secondary and higher education (summing categories "3" and "4").

Proportion of parents with high-status jobs. Computed as the number of parents who are civil servants or have a professional job like lawyer or doctor (category "2").

Municipality

Poverty rate. Calculated from the national socio-economic survey (CBS, 2010), ranging from 2.48 percent to 48 percent with an average of 13.3 percent.

Location. Categorical variable, distinguishing municipalities on Java Island vs non-Java municipalities.

Average school size. Mean over all schools in the municipality, ranging from 3 to 164.5.

Mean school proportion of female students. Mean over all schools in the municipality, ranging from 0 to 0.84

Mean school proportion of well-educated parents. Ranges from 0 to 1, with an average of 27.8 percent.

Mean school proportion of parents with high-status jobs. Ranges from 0 to 1, with an average of 24.9 percent.

The exam scores of modernist madrasahs and schools are the lowest at student, school and municipality levels. These schools are, more than the other streams, located outside Java. Parental education and job status is highest in integrationist institutes, and in the traditionalist and modernist non-madrasah schools somewhat higher than in the same stream madrasahs, also at all three levels. Pupils in madrasahs have higher test scores in the traditionalist and modernist streams and in all subjects. School and municipality average exam score differences between madrasahs and non-madrasahs are similar for the modernist streams, whereas the average school score differences in the traditionalist stream almost vanish but the average municipality score differences increase.

5.4.4 Analytical strategy

As a preparatory step to a multivariate analysis, bivariate association measures were computed at the three levels. The hypotheses set forth in the previous sections were investigated using multilevel analysis (see, e.g. Snijders & Bosker, 2012). Multilevel analysis is appropriate because it takes into account the inherent dependent nature of scores of students in the same classroom or school, in the same region, allowing proper testing of the hypotheses formulated at the student, school, and municipality levels.

For each of the three National Exam subject scores, in math, science, and English, a model is built in four steps, using a forward selection strategy to take into account more potential confounders. The first model contains student-level variables, i.e., age and parental SES characteristics education and occupation. In the second step school-level variables, i.e. school type as characterized by stream and track, school size and aggregated SES variables are added, followed by district-level characteristics, i.e., poverty rate and aggregated SES variables expressed as percentage of well-educated parents and percentage of parents working as professionals (including civil servants), in the third step.

To investigate whether the model parameters are constant across school type and to test hypotheses 3 and 4, within-level and cross-level interactions are added in a final step of which significant effects are retained.

5.5 Results

Table 5.2 gives a description of the correlations between factors at the student, school and municipality levels. Not surprisingly, the three NE scores are highly correlated at all levels, with the strongest association between math and science. Most correlations are in the expected direction, but rather low. Overall, the correlations for all subjects at the school and municipality levels are about equal and higher than those correlations at the student level. This confirms that it is important to distinguish effects of explanatory factors at all levels in the multilevel modelling as laid out in the analytical strategy.

Table 5.2 Correlations at student, school and municipality-level variables

Variables	1	2	3	4	5	6	7
	Student (N=156,952)						
1. Math score and its average		.677**	.596**	-.107**	.036**	.076**	.056**
2. Science score and its average	.895**		.575**	-.105**	.027**	.079**	.050**
3. English score and its average	.828**	.817**		-.139**	.087**	.120**	.068**
4. Student age and its average	-.150**	-.155**	-.213**		-.124**	-.118**	-.055**
5. Student gender (1=girl and proportion of girl)	.047**	.042*	.059**	-.169**		-.018**	-.009**
6. Parent education (1=senior/higher and its proportion)	.045*	.051**	.112**	-.235**	-.059**		.284**
7. Parent job (1=professional and its proportion)	.073**	.093**	.122**	-.167**	-.035*	.548**	
8. School size (continuos)	-.048**	-.057**	-.022	-.208**	.082**	.123**	.146**
Municipality-level variables (N=366)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Math score average	1						
2. Science score average	.878**	1					
3. English score average	.842**	.805**	1				
4. Municipality poverty rate	.122*	.090	.046	1			
5. Student age, average	-.181**	-.162**	-.222**	.130*	1		
6. Proportion of females	.051	.060	.065	-.014	-.225**	1	
7. Proportion of senior/higher education parents	-.063	-.045	.004	-.176**	-.285**	-.026	1
8. Proportion of professional parents	-.022	.003	-.015	.039	-.174**	.066	.553**

School (N=3,150)

*Note: * p < 0.05, ** p < 0.01.*

5.5.1 Multilevel analysis

We started our analysis by estimating a Null Model with the intercept variances at the student, school and municipality levels. The intercept-only model from the Null Model estimates the intercept as 5.58, 5.76 and 5.43, which are simply the weighted average scores for mathematics, science and English across students, schools and municipalities and (almost) equal to the means represented in Table 5.1. The variances of the student, school and municipality-level residual errors for all subjects are highest at the individual level with 1.96 for math, 1.54 for science and 1.50 for English. The lowest variances at the school level are 1.08, 0.74 and 0.61, respectively. Calculated from the school variance divided by the total variance, i.e. the sum of the student, school and municipality variances, the intra-class correlation at the school level equals 0.32 for mathematics, 0.32 for science and 0.28 for English. These numbers can be considered substantial, and an extra justification for using multilevel analysis. In the final model, the total variance is only slightly reduced, which implies that although the variables included in the model significantly contribute to explaining the variance, the total explained variance is low.

Table 5.3 displays the estimation results for the four different specifications of the educational production function: Model 1 includes only the student-level variables: age, gender, parental education and occupation. Model 2 additionally includes the school-level variables: track, stream, proportion of students from at least a senior educational background, proportion of parents in a professional occupation and school size categorization. Model 3 takes into account the municipality-level characteristics: poverty rates, proportion of students from at least a senior educational background, and proportion of parents in a professional occupation. Finally, Model 4 also includes the cross-level interactions between the student and school-level factors, and between the municipality and school-level factors.

From Model 1 in Table 5.3 it becomes clear that female students have significantly higher scores than male students in all subjects. The largest score differences between girls and boys are in English by 0.3 points, and the smallest difference is in science by 0.1 points. Similarly, children of higher educated parents and professional parents have significantly higher scores, leading to a difference of about 0.2 points and 0.1 points, respectively. However, scores for all subjects decrease as students become older. These results are stable after taking into account the variables at the school level (Model 2), the municipality level (Model 3) and the within- and between-level interactions (Model 4).

Table 5.3 Multilevel results on student achievement: student and school-level factors
N_{level1}=156,952; N_{level2}=3,150; N_{level3}=366.

Variables	Model 1						Model 2					
	Math		Science		English		Math		Science		English	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Fixed Part												
Intercepts	5.510	0.071	5.703	0.061	5.268	0.054	5.944	0.112	6.097	0.095	5.889	0.084
Student-level variables												
Age	-0.136	0.004 ***	-0.121	0.004 ***	-0.139	0.004 ***	-0.136	0.004 ***	-0.120	0.004 ***	-0.139	0.004 ***
Gender: Boy *(ref.)*												
Girl	0.108	0.007 ***	0.065	0.006 ***	0.259	0.006 ***	0.108	0.007 ***	0.065	0.006 ***	0.259	0.006 ***
Parent's education: Junior and below *(ref.)*												
- Senior/higher edu	0.101	0.011 ***	0.112	0.010 ***	0.184	0.010 ***	0.101	0.011 ***	0.112	0.010 ***	0.182	0.010 ***
Parent's occupation: Non-professional *(ref.)*												
- Professional	0.138	0.018 ***	0.084	0.016 ***	0.134	0.016 ***	0.137	0.018 ***	0.083	0.016 ***	0.132	0.016 ***
School-level variables												
Track: Non madrasah *(ref.)*												
- Madrasah							0.278	0.046 ***	0.238	0.038 ***	0.227	0.034 ***
Stream: Integrationist *(ref.)*												
- Tradisionalist							-0.486	0.104 ***	-0.454	0.086 ***	-0.715	0.077 ***
- Modernist							-0.639	0.097 ***	-0.565	0.080 ***	-0.799	0.072 ***
Random Part												
- Municipality-level	1.445	0.134	1.089	0.100	0.817	0.076	1.454	0.134	1.098	0.100	0.841	0.077
- School-level	1.068	0.030	0.729	0.021	0.593	0.017	1.030	0.029	0.702	0.020	0.556	0.016
- Student-level	1.938	0.007	1.526	0.006	1.465	0.005	1.938	0.007	1.526	0.006	1.465	0.005
*-2*loglikelihood:*	559,538		521,682		514,785		559,445		521,586		514,627	

*Note: * P < 0.05; ** P < 0.01; *** P < 0.001.*

The first hypothesis predicts that *students who attend private madrasahs attain a lower level of achievement than students who attend private non-madrasahs.* Results provide evidence contradictory to our expectation. Data show that children attending madrasahs perform better than their non-madrasah counterparts. The findings in Model 2 Table 5.3 reveal that scores of students attending private non-madrasahs generally have significantly *lower* scores in math, science and English compared to those enrolled in private madrasahs, by 0.3, 0.2 and 0.2 points, respectively.

These findings are quite stable, as shown in Model 3 and Model 4. For instance, after controlling for municipality factors (Model 3) and adding interaction effects (Model 4), the effects of attending madrasahs remain similar. Moreover, in madrasahs, girls perform better in science than boys, whereas children of well-educated parents perform slightly less well in English compared to children of parents with lower education (see Table 5.4).

Interestingly, whereas in municipalities with a higher poverty rate, student performance in non-madrasahs is higher in math and science, in madrasahs this effect is absent in science and less strong in math. Student achievement in English in municipalities with a higher poverty rate is higher in traditionalist and modernist madrasahs and non-madrasahs, and lower in integrationist madrasahs (compared to integrationist non-madrasahs). Municipalities with a large number of schools have higher math and English student performance.

Table 5.4 School track and stream on student achievement: student, school, municipality-level factors and their interaction effects $N_{level1}=156,952$; $N_{level2}=3,150$; $N_{level3}=366$.

Variables	Model 3						Model 4					
	Math		Science		English		Math		Science		English	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Fixed Part												
Intercepts	6.419	0.189	6.540	0.163	5.948	0.096	5.791	0.216	6.044	0.185	5.479	0.131
Student-level variables												
Age	-0.136	0.004 ***	-0.120	0.004 ***	-0.139	0.004 ***	-0.136	0.004 ***	-0.121	0.004 ***	-0.139	0.004 ***
Gender: Boy *(ref.)*												
- Girl	0.108	0.007 ***	0.065	0.006 ***	0.259	0.006 ***	0.389	0.030 ***	0.238	0.027 ***	0.359	0.026 ***
Parent's education: Junior and below *(ref.)*												
- Senior/higher edu	0.101	0.011 ***	0.113	0.010 ***	0.183	0.010 ***	0.101	0.011 ***	0.112	0.010 ***	0.208	0.012 ***
Parent's occupation: Non-professional *(ref.)*												
- Professional	0.137	0.018 ***	0.083	0.016 ***	0.132	0.016 ***	0.138	0.018 ***	0.084	0.016 ***	0.133	0.016 ***
School-level variables												
Track: Non madrasah *(ref.)*												
- Madrasah	0.269	0.046 ***	0.231	0.038 ***	0.223	0.034 ***	0.267	0.046 ***	0.202	0.039 ***	0.243	0.035 ***
Stream: Integrationist *(ref.)*												
- Tradisionalist	-0.507	0.104 ***	-0.472	0.087 ***	-0.727	0.078 ***	0.209	0.174	0.154	0.145	-0.146	0.134
- Modernist	-0.671	0.097 ***	-0.589	0.081 ***	-0.813	0.072 ***	0.014	0.154	-0.058	0.128	-0.344	0.121 **
Municipality-level variables												
Poverty rate	2.179	1.082 *	1.319	0.934	0.625	0.835	2.944	1.134 **	2.434	0.983 **	-1.930	1.519
Parents with senior education	-0.393	0.322	-0.365	0.278	-0.247	0.249	-0.364	0.322	-0.170	0.287	-0.197	0.248
Number of schools	0.010	0.006	0.012	0.005 **	0.006	0.004	0.009	0.006	0.011	0.005 *	0.007	0.004
Region: Non Java *(ref.)*												
Java	-0.622	0.166 ***	-0.475	0.144 ***	-0.271	0.129 *	0.212	0.240	0.208	0.204	0.215	0.183

*Note: * P < 0.05; ** P < 0.01; *** P < 0.001.*

Table 5.4 School track and stream on student achievement **(Continued)**.

Math	Model 3						Model 4					
	Math		Science		English		Math		Science		English	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Cross-level interaction effects												
School and student-level												
- Madrasah x Girl									0.047	0.015 ***		
- Madrasa x well-educated parent											-0.068	0.019 ***
- Tradisionalist x Girl							-0.316	0.032 ***	-0.222	0.030 ***	-0.103	0.028 ***
- Modernist x Girl							-0.282	0.032 ***	-0.190	0.028 ***	-0.111	0.028 ***
Municipality and school-level												
- Municipality poverty rate x Madrasah							-1.580	0.819	-2.358	0.741 ***	-1.313	0.639 *
- Municipality poverty rate x Traditionalist											3.548	1.491 **
- Municipality poverty rate x Modernist											3.320	1.361 **
- Proportion of well-edu. parents x Madrasah									-0.510	0.234 **		
- School number at municipality x Madrasah							0.003	0.001 **	0.003	0.001 **		
- Java x Tradisionalist							-0.920	0.210 ***	-0.818	0.175 ***	-0.653	0.158 ***
- Java x Modernist							-0.924	0.195 ***	-0.730	0.162 ***	-0.507	0.147 ***
Random Part												
- Municipality-level	1.348	0.126	1.031	0.095	0.821	0.076	1.348	0.126	1.027	0.094	0.810	0.075
- School-level	1.030	0.029	0.702	0.020	0.556	0.016	1.019	0.029	0.693	0.020	0.550	0.016
- Student-level	1.938	0.007	1.526	0.006	1.465	0.005	1.936	0.007	1.526	0.006	1.465	0.005
*-2*loglikelihood:*	*559,422.7*		*521,567.9*		*514,619.2*		*559,294.9*		*521,474.0*		*514,561.1*	

*Note: * P < 0.05; ** P < 0.01; *** P < 0.001.*

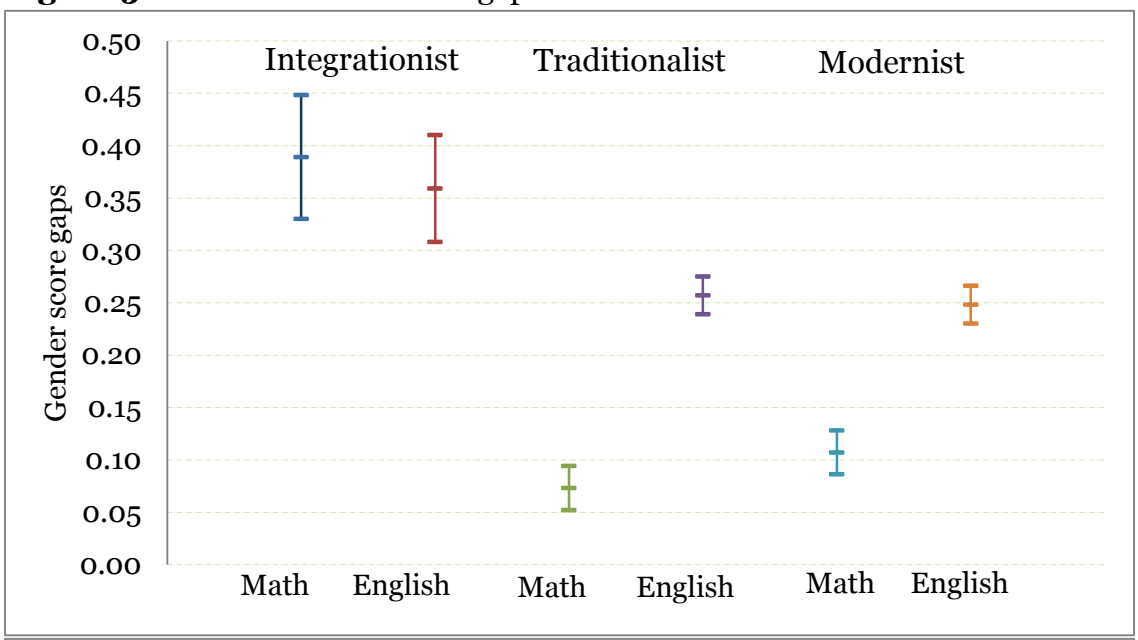
The second hypothesis assumes that *students in the integrationist stream attain higher academic achievement than those in modernist and traditionalist streams*. In general, our findings are in line with the hypothesis that the scores of students in the integrationist stream are higher than those of their peers in modernist and traditionalist streams in all subjects, where the differences between the streams depend on student's gender and municipality location and poverty. Consequently, the results partially support hypothesis 2. The results also reveal a complex interplay between individual, school and municipality-level factors that we need to bear in mind when testing the hypotheses and interpreting the model parameters.

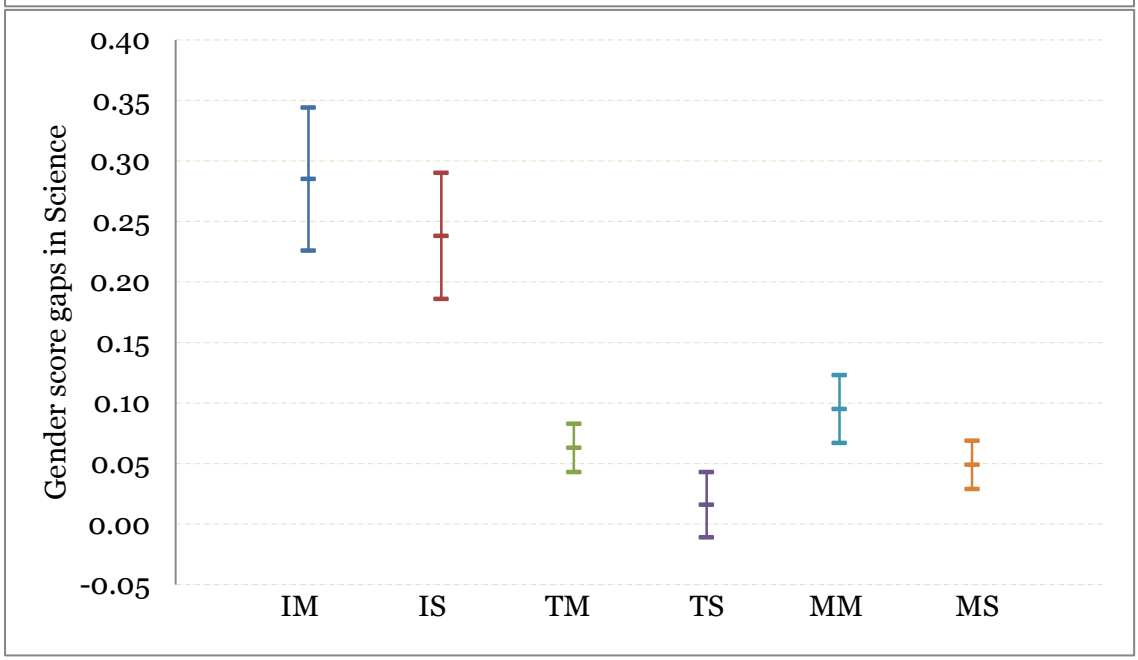
Taking into account the cross-level interactions: (1) between school types and student characteristics, and (2) between school types and municipality factors, a difference in English student achievement is found only between the modernist stream and the integrationist stream. Although girls perform better in all subjects than boys, their achievement is somewhat lower in traditionalist and modernist schools compared to integrationist schools.

Note that by carefully investigating the first two hypotheses, the third hypothesis reading *gender-based achievement gaps in private madrasahs are greater than in private non-madrasah (H3a)* and *gender-based achievement gaps in the integrationist stream are greater than those in traditionalist and modernist streams (H3b)* has been addressed and mostly supported.

Figure 5.2 shows that the gender achievement gap in private madrasahs is higher than in private non-madrasah counterparts in science, but there are no differences for math and English. This finding thus partially supports hypothesis 3a. Figure 5.2 also reveals that for all subjects, the gender achievement gap in the integrationist stream is larger than the gap in the traditionalist and modernist streams, which supports hypothesis 3b.

Figure 5.2 Gender achievement gaps across tracks and streams





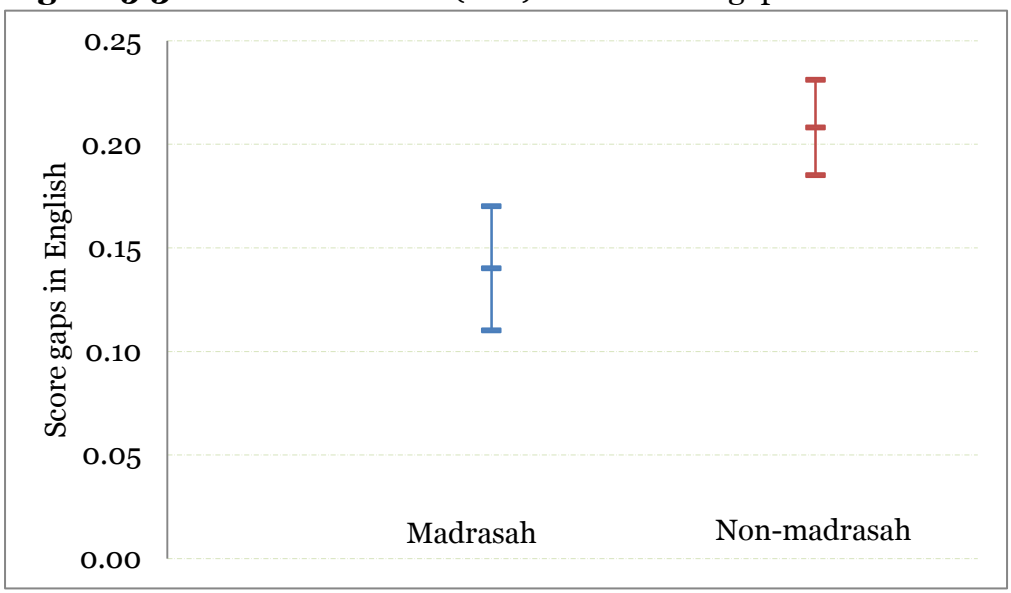
Notes:
*IM=Integrationist madrasah; IS= Integrationist school/non-madrasah; TM= Traditionalist madrasah; TS= Traditionalist school; MM= Modernist madrasah; MS=Modernist school.
**Figures are based on Model 4 in Table 5.4.

The difference in student performance between the traditionalist and modernist streams and the integrationist stream is greater on Java (in favor of integrationist schools) compared to schools in other regions.

The final hypothesis postulates that *the SES achievement gap in private madrasahs is greater than in private non-madrasahs (H4a) and the SES achievement gap in integrationist schools is greater than those gaps in both traditionalist and modernist schools (H4b)*. The results fully refute this set of hypotheses as represented in Model 4 in Table 5.4 and Figure 5.3.

Model 4 in Table 5.4 illustrates that the effects of SES as represented by parental education and occupation are significantly positive for all subjects. Enrolling in private madrasahs significantly reduces the advantage of students from well-educated parents over those from low-educated parents. Thus, the SES achievement gaps in private madrasahs are smaller than in private non-madrasahs as shown in Figure 5.3, which is contradictory to our hypothesis (H4a).

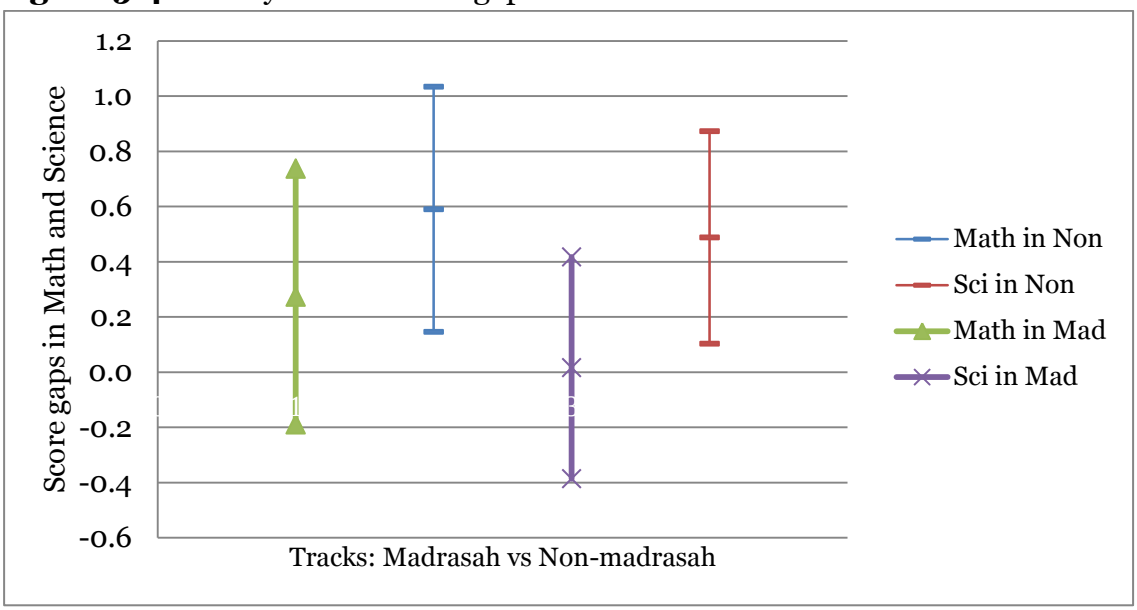
Figure 5.3 Parental education (SES) achievement gaps across tracks



Note:
*Figures is based on Model 4 in Table 4.

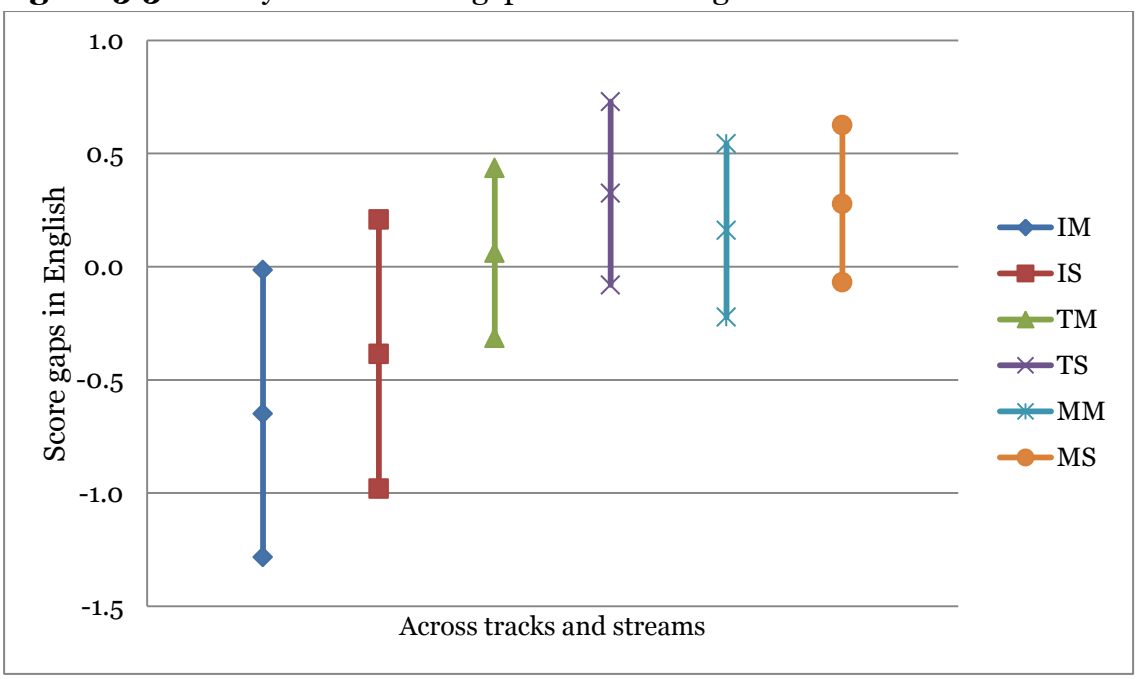
Figure 5.4 and 5.5 reveal that there ares no cross-level interaction between parental SES and school streams, implying that there are no differences in SES achievement gaps between students in integrationist streams and their other counterparts for all subjects, which contradicts our hypothesis (H4b).

Figure 5.4 Poverty achievement gap of 20% for Math and Science across track



Note:
*Figures are based on Model 4 in Table 4.

Figure 5.5 Poverty achievement gap of 20% in English across track and stream



Notes:
*IM=Integrationist madrasah; IS= Integrationist school/non-madrasah; TM= Traditionalist madrasah; TS= Traditionalist school; MM= Modernist madrasah; MS=Modernist school.
**Figures are based on Model 4 in Table 4.

A summary of the results of the six hypotheses is provided below, in Table 5.5.

Table 5.5 Overview of hypotheses and findings of our analyses

No.	Hypotheses	Results
1	Students who attended the private madrasahs have a lower level of achievement than students who attended private non-madrasahs (H1).	Refuted (X): *students in madrasah attain a higher level than their peers in non-madrasah.*
2	Students in Integrationist stream have higher academic achievement compared to those in Modernist and Traditionalist streams (H2).	Partially supported (√): *girls in Integrationist stream attain higher.*
3	Gender-based achievement gaps in private madrasahs are greater than in private non-madrasahs (H3a) and gender gaps in Integrationist stream are greater than in Traditionalist and Modernist streams (H3b).	Mostly supported (√): *Gender gap in madrasah is greater in science, and gender gap in Integrationist stream is greater in all subjects.*
4	SES achievement gaps in private madrasahs are greater than those in private Islamic schools (H4a) and SES achievement gaps in Integrationist stream are greater than those in Traditionalist and Modernist streams (H4b)	Refuted (X): *SES gaps in madrasah are smaller and there are no differences in SES gaps across streams.*

Finally, although no hypotheses were formulated at the district level, the findings regarding municipality characteristics deserve further attention and interpretation, which will be offered in the discussion section.

5.6 Discussion and conclusion

In this study, we assessed the effects of various organizational (tracks) and ideological (streams) in Indonesian private Islamic schools on students' academic achievement and achievement gaps across gender and parental SES. Adopting an education production function approach, it was expected that student achievement is a function of a school's investment in teaching-related activities and resources (Hanushek, 2007; Coates, 2003; Bowles, 1970). We discussed four dimensions of investments including: investments in the primary process, teachers, students, and in organization and coordination. We argued that the more time, money and attention that are devoted to students, the more they will learn, and the higher their performance and the smaller their achievement gaps are likely to be.

The results of the multilevel analyses, confirming that investments in teaching time, more qualified teachers and financial incentives are related to higher student performance, echo results from educational studies outside Indonesia (Grave, 2010; Stinebrickner & Stinebrickner, 2008; Darling-Hammond, 2000; Hanushek, 2006). In addition, findings prove that gender achievement gaps in the integrationist stream are higher than in other streams for all subjects. The gender achievement gap in private madrasahs is higher than in private non-madrasahs in science, but this does not hold for math and English. It could be concluded that investment decisions indeed matter, but that their effects are largely contingent upon the context in which the investments were made.

This study also resulted in some contradictive findings, for which we will offer some tentative explanations. In terms of organizational perspective (track), we predicted in agreement with general perceptions on madrasahs and resource investments, that student achievement in madrasahs is lower than in non-madrasahs, but we found contradictive evidence for this. This contradictive finding is not easy to interpret. Perhaps it can be explained by the selection of the proxy variables at the student level that could not fully assess prior student achievement. It may be that students in madrassah schools are overall better students than students in non-madrassah schools. In the present study, however, we were unable to control for prior student achievement.

A second contradictive finding is that the SES achievement gap for English in private madrasahs is smaller than in private non-madrasahs. This unexpected finding is difficult to interpret. We previously assumed that decentralization only benefited non-madrasahs and not madrasahs. This could be true for public non-madrasahs, which are directly managed by the local government, but not for private non-madrasahs, which are owned by non-government organizations. A previous study by Ghozali, Mudjahid and Hayati (2013) showed that local governments 1) do not treat private non-madrasahs equally as independent institutions and 2) provide scholarships and school grants for both non-madrasahs and madrasahs to reduce political risk in direct elections. The smaller gap found only for English in private madrasahs could be related to effects of parental SES and region. Student achievement in traditionalist and modernist streams in all subjects is lower on the island of Java than in other regions of the Indonesian archipelago. In addition, compared to

learning math and science, learning English can also be influenced by learning outside school, such as attending extra language courses or having media access to English materials. High-SES parents have more possible access to English courses and to resources like multimedia, especially on Java.

The expected better performance of students in integrationist streams compared to their traditionalist and modernist counterparts was found to be highly dependent on gender and municipality. Female students have a pronounced advantage in integrationist schools, which are characterized by single sex education. This may be in line with findings from other studies showing single sex education to minimize distractions, reduce discipline problems, and boost the self-esteem and confidence of girls, thus leading to high performance (Piper, 2008; Bracey, 2006; Gurian & Henley, 2001; March, Byrne & Yeung, 1999).

In addition to some contradictive findings, the study also revealed an unexpected finding. No differences were found between the Integrationist stream and the two other streams with regard to SES achievement gaps. This implies that ideological views, which are operationalized by financial or other support for low SES pupils in traditionalist and modernist streams, do not appear to help to narrow the SES achievement gap. Perhaps the financial and other support for students from families with low SES increase their daily attendance. The resultant improvement is too small to adequately reduce the SES achievement gap.

As noted before, in terms of organization (track), the role of municipalities became very important after the implementation of a decentralized education system. Even though the effects of municipality poverty rate differ across subjects, these effects are significant, with similar patterns for math and science, which differ from English. To facilitate interpretation, we calculated the effects of a municipality poverty rate gap of 20 percent. For math and science, Figure 5.4 reveals that the student achievement gap is lower in madrasahs than in non-madrasahs. For English, Figure 5.5 shows that the gap is smaller in the integrationist stream than in the traditionalist and modernist streams.

To summarize, the findings in this study confirm the value of the education production function approach and reveal the importance of municipality factors. Before discussing the implications of our findings, however, we acknowledge some limitations of this study.

First, the modest degree of explained variance at all levels might be partly due to our use of aggregate variables at the school-level. The results revealed important significant effects at the student-level, such as age and gender. In view of the substantial variability at the municipality-level, it would be worthwhile to include more variables related to municipality, like sub-district and village characteristics. The development of more fine-grained variables and measurements may help to unravel the mechanisms underlying the relation between private Islamic school types and student achievement and achievement gaps.

Second, in spite of the consistency with our theoretical reasoning, in the study we used cross-sectional data that impede causal inferences. Further studies, therefore, would profit from a longitudinal design to disentangle causality relations between resource investment and student achievement. Moreover, such a design could account for the effect of prior student achievement.

Apart from these limitations, our study discloses several general implications for research and policy. It refines current research on student achievement and achievement gaps in three ways. *First*, our study provides insights into strengths and weaknesses across school tracks and streams. Such insights can enable local governments to develop better and more equal interventions to improve education in Islamic private madrasahs and non-madrasahs, both in the domains of school funding and teacher development. The patterns seem to indicate that the government's interventions to improve Islamic private schools need to be focused on the traditionalist and modernist streams. Both streams predominantly serve children from low SES parents, and are thus associated with limited parental resources, leading in turn to inadequate school incomes. In addition, the presence of modernist schools in all provinces and almost all municipalities indicates that they reach diverse students across the country, including remote areas where public schools do not exist. Therefore, improving the quality of modernist and traditionalist schools would lead to improved quality of learning for underprivileged and underserved students.

Second, our study suggests that although school tracks and streams matter, student and family characteristics are still strong determinants of student achievement and achievement gaps. Examination of the cross-level interaction between gender and school streams shows that the effects of school streams are only significant for girls in the integrationist stream, implying that differences across streams affect girls and boys differently. This result provides new insight into the conditions under which students perform better in the Islamic private school. For instance, girls seem to profit from the implementation of single sex education in private Islamic schools but boys do not have those benefits.

Third, to our knowledge, this study is the first empirical attempt to test the relation between characteristics of private Islamic school tracks and streams and student achievement and achievement gaps in Indonesia, one of the largest Muslim countries in the world. Most research in student achievement and achievement gaps has been conducted in schools in general (Suharti, 2013; Suryadarma, 2010) or comparing public and private schools (Newhouse & Beegle, 2006). This study, therefore, fills a gap to enrich the literature on the education production function approach by adding information about organizational and resource investments in a specific context of private Islamic school tracks and streams.

6

Discussion and Conclusion

6.1 Conclusion

Inequality in access to and quality of education in developing countries, such as Indonesia, is to some degree inevitable for the initial stages of development (Kuznets in Galbraith, 2007). Nevertheless, high educational inequality creates moral questions, and can result in social divisions that reduce the efficiency of both government and society (Budihardjo, 2011; Kozol, 2005; De Gregorio, 2002). It is therefore considered an important sector for government intervention, also in developing countries.

There are no secret formulas for governments to design policies to mitigate education inequality, and Indonesia is no exception. For instance, since the 1970s, in order to reduce inequality in access to education, the government started to expand access to primary education. The idea behind this was to make sure that all children from the age of seven to twelve years old would have access to school, particularly in rural, new settlement and disadvantaged urban areas. In July 2005, in order to push towards universal primary and junior secondary education, the government introduced a *Free Basic Education* (FBE) (Paqueo & Sparrow, 2005). However, despite these measures, education inequality is still pervasive in Indonesia, showing that it is not easy to address inequalities in this sector (CBS 2016 calculated by Bappenas; World Bank, 2014; OECD, 2012).

It is a common understanding that inequalities in Indonesia's education system are due to differences in resources related to family socio-economic status (SES), public and private school governance, and local government investments (Al-Samarrai, 2013; Suharti, 2013; Newhouse & Beegle, 2006). However, inequality in access to and quality of education seems to be a more complex problem related to many factors across various levels and different types of resources (Lynch & Baker, 2005). So far, little systematic empirical research disentangles this complexity of multilevel and multi-resource determinants. This dissertation is among the first attempts to bridge this gap.

Building on a multilevel multi-resource approach and utilizing a combination of empirical nation-wide datasets by means of multilevel statistical techniques, this dissertation explored the impact of and interplays between human, social, economic, political and infrastructural capital at the individual, household, school, community and government level. In this way, and through the identification of *within-level cross-resource effects* (e.g. the household social capital compensated for a lack of economic resources), *between-level single-resource effects* (cf. community social capital strengthened household social capital) and *between-level cross-resource effects* (e.g. urbanization reinforced the effect of community association), this study provides deeper insights into which kind of resources contribute to reduce educational inequality, at which levels, and by means of what mechanisms. This may help stakeholders and the government to identify efforts needed to narrow this inequality in Indonesia.

This concluding chapter summarizes the main findings of each chapter. This is followed by a discussion of the theoretical, methodological and practical contributions of this dissertation, followed by a discussion of limitations and avenues for future research.

6.2 Summary of the main findings

6.2.1 Municipality and household resources' effect on the likelihood of children to be in or out of school

Chapter 2 explored the effect of municipality and household resources on the likelihood of children to be in or out of school. After the implementation of a decentralized education system in Indonesia, local governments have become crucial actors in providing access to education. Differences in municipality resources in these autonomous local governments may therefore influence the accessibility and affordability of schools. Accessible and affordable schools enable parents to send their children to school. Municipalities with more resources, for example, can provide more scholarships to households, which might attract poor pupils to attend or return to school. Also, differences in household resources, such as income, education investments, parents' educational level, household structure, and distance to school, are very crucial in parent's decisions on children's education. Furthermore, parent's wealth links to education investments and associates with the degree of awareness of the importance of education as a vehicle of social mobility. This awareness increases the importance parents attach to education, and therefore the price they are willing to pay.

Our analysis of the effect of differences in municipal and household level resources on the likelihood of children to be out of school showed that municipality education expenditure can help prevent dropout but it could not attract children to attend school to begin with. Conversely, the availability of schools decreases the likelihood that children never attend school but it does not reduce dropout. High municipality poverty rates increase the likelihood of children never attending school and dropping out school (out of school). Family factors, such as wealth, education investment and educational background also reduce the likelihood that children are out of school. We conclude that municipalities that combine the resources of good school availability and high(er) education expenditure seem to be better able to prevent that children drop out of or never attend school.

All in all, our analyses show that *economic resources* at both the municipal and household level affect the likelihood of children to be out of school differently, for different groups (i.e. children dropping out or never attending). Also, *human capital* at the household level contributes to the likelihood of children out of school, with children from less educated parents being more likely to never attend or drop out of school.

6.2.2 The moderating role of social capital

Chapter 3 examined to what extent socio-economic status (SES) and social capital affect preschool participation and whether social capital can compensate and complement these SES effects. High SES links to a household's spending capacity, high educational

expectations, and to modernization and urbanization; elements that all are expected to affect preschool participation (Galab *et al.*, 2013; Davis-Kean, 2005; McNeal, 1999).

Next to SES, we argued that social capital could be an important determinant of educational outcomes. Social capital enables individuals and groups to achieve their objectives by sharing information and transferring values and norms. It also facilitates members of a group to cooperate. Social capital in this particular study resides in relations between individuals in families and communities who interact with others, both within the village and between villages. We identified three dimensions of social capital: association, trust and reciprocity and reasoned how these dimensions may influence children's preschool participation.

We found that parental income and education are strong determinants of preschool enrollment, whereas living in a poor rural area with lack of access to media is associated with declining preschool participation. Social capital represented by household association and community reciprocity increase preschool participation. Social capital based on perceived reciprocity compensates low-income parents that empower them to send their children to preschool.

In addition, we also found three interplay mechanisms: (1) one *within-level cross-resource effect* is that reciprocity, as a component of social capital at the household level, is able to compensate low-income families for sending their children to preschool; (2) a *between-level single-resource effect* is that the effect of association as a social resource at the household level on preschool participation becomes stronger if the household resides in an area with higher community trust, which is also a type of social resource; (3) a *between-level cross-resource effect* consists in urbanization reinforcing the effect of community associations, and weakening the effect of community reciprocity on the likelihood of children attending preschool. Overall, a combination of different types of resources, such as *economic, human, social and infrastructural capital*, in both *household and village levels*, contribute to preschool participation.

6.2.3 Political resources' effect on the length of schooling

Chapter 4 studied the effects of implementing a decentralized education system on the progress of and variations in the mean years of schooling between Indonesian municipalities and provinces. A decentralized education system is assumed to be good for education because it allows municipalities to raise more of their own resources, which is conducive to improve educational attainment.

Differences between municipalities, relating to voters' preferences but also decision-making and implementation capacity at the municipal level, may intensify regional variations in educational attainment. For example, decentralization may increase disparities in municipality education expenditures, which thus enlarges gaps in fiscal capacities for education across municipalities. Furthermore, differences in terms of

urbanization, level of development and newly created municipalities may widen disparities, such as in infrastructure, facilities, and travel distances to school, which in turn can influence variations in educational attainment. Thus, decentralization generates differential effects on the improvement and progress of educational attainment between municipalities and between provinces.

We found that the decentralized education system as a political resource slightly improved the length of schooling. However, the aggregate improvement after decentralization is smaller than before decentralization. It also slightly decreased variation between provinces, but the variation among municipalities increased. Development and urbanization significantly improve the length of schooling. However, fiscal capacity and newly created municipalities do not have a significant effect on improving the length of schooling. It could be concluded that while municipal economic resources did not improve educational attainment at municipal level, urbanization, type and level of municipal development as a social resource significantly improved educational attainment.

6.2.4 The effect of organizational and ideological resources on achievement and achievement gaps

Finally, chapter 5 investigated whether ideological and organizational differences between Islamic private schools, and the resulting differences in resources and investment decisions, have consequences for educational achievement and gender and SES gaps in achievement. Ideological differences relate to how private Islamic education providers interpret their religion in the Indonesian social and educational context that consists of Traditionalists, Modernists and Integrationists, organizational differences connect to the role of the government in managing private Islamic schools. Madrasah is managed by the Ministry of Religious Affairs (MoRA) and non-madrasah is coordinated under the Ministry of Education and Culture (MoEC).

Based on these distinctions, we reasoned that, compared to private madrasahs, private non-madrasahs have more resources: they devote more time to teaching, have more qualified teachers, and invest more in students, organization and coordination. This difference in investments is assumed to significantly enhance student performance in non-madrasahs compared to their madrasah peers. In terms of ideological differences, the Integrationist stream devotes more teaching time by better teachers and more resources when compared to Traditionalist and Modernist streams. The Integrationist stream also provides extra attention to national exam subjects, which is expected to lead to higher academic achievement compared to the Modernist and Traditionalist streams. We found that student achievement in madrasahs is higher than in the non-madrasahs, and the achievement of girls is higher in the Integrationist stream.

In terms of the gender achievement gap, compared to non-madrasahs, madrasahs tend to be stricter and they are mainly practicing a tradition of single sex education (SSE).

This is comparable with the Integrationist stream. Single sex education has been found to make girls freer and more competitive and to enable them to focus more on learning, leading to increased educational achievement. Single sex education is assumed to widen the gender gap to the benefit of girls. Our findings show that in the subject "Science", girls in the Integrationist stream and girls in madrasahs indeed perform better than their peers in other streams.

In terms of the SES achievement gap, non-madrasah schools have more resources: they can provide more financial support to low SES students to improve their achievement and reduce the SES gap. Unlike the Integrationist stream, Traditionalist and Modernist streams financially support low SES students, which may improve the performance of low SES students and reduce the SES achievement gap. Our analyses showed that, for English, the SES gap in private madrasahs is smaller than in their non-madrasah counterparts.

We found two interplay mechanisms. First, even though girls in general perform better than boys, *between-level and cross-resource effects* reveal that attending in Traditionalist and Modernist streams significantly decrease the achievement of female students. Second, compared to non-madrasah schools, madrasahs have less economic resources. *Between-level single-resource effects* show being located in a municipality with a high poverty rate diminishes madrasah's positive effect on student achievement. Overall, although student characteristics and *economic and human capital* at the household level strongly affect student achievement and achievement gaps, our findings suggest that differences in *resource investment decisions across school tracks and streams* also play an important role.

Table 6.1 summarizes the main theoretical mechanisms, outcomes and predictors, hypotheses and findings of each study.

Table 6.1 Summary of theoretical frameworks and findings of empirical chapters (2-5)

Mechanism	Description	Outcomes and predictors
Chapter 2 Opportunity and constraint	☞ Resources at both municipality and household may provide educational opportunities and constraints. ☞ Public education expenditure, poverty rate and average household education expenditure will explain why some children are in school and others not. ☞ Household's income, education investments, education, structure, and distance to school influence children's opportunities to attend school.	⇨ *Outcome*: Out-of-school ⇨ *Predictors*: Municipality and household resources
Chapter 3 Social capital theory	☞ Resources at household and community-level, such as SES and access to media explain preschool enrolment. ☞ Differences in social capital play important role in parents' decision on their children preschool. ☞ Social capital can be also an effective buffer against the negative effect of lack of SES or it may complement other forms of capital.	⇨ *Outcome: Preschool enrollment* ⇨ *Predictors: Household and community resources.* ⇨ *Moderator: Social capital (association, trust, reciprocity)*
Chapter 4 Decentralization	☞ Decentralization generates differential effects on length of schooling in the various regional and local levels. ☞ It enables the local government to respond to local demands, improve accountability and effectiveness, which turn to increase length of schooling. ☞ It could also have negative effects if the educational service at the local level do not function well.	⇨ *Outcome: Length of schooling* ⇨ *Predictors: Decentralization, fiscal capacity, urbanization, level of development, proliferation*
Chapter 5 Education production function and governance approach	☞ Ideological and organizational differences between Islamic private schools have consequences for investment and resource allocation decisions. ☞ These variations in investments might explain variations in student achievement and achievement gaps between the various types of private Islamic schools in Indonesia.	⇨ *Outcomes: Student achievement and achievement gap* ⇨ *Predictors: School tracks and streams* ⇨ *Moderators: Parent SES and gender*

Table 6.1 Continued

Hypotheses	Findings
H1: Municipality education expenditure => never attend and drop-out (-)	❖ Drop-out (√) but never attend (X)
H2: Municipality poverty rate => never attend and drop-out (+)	❖ Both never attend and drop-out (√)
H3: Mean household edu. expenditure => never attend and drop-out (-)	❖ Never attend (√) but drop-out (X)
H4: Household expenditure => never attend and drop-out (-)	❖ Both never attend and drop-out (√)
H5: Household education expenditure => never attend and drop-out (-)	❖ Both never attend and drop-out (√)
H6: Head of household education => never attend and drop-out (-)	❖ Both never attend and drop-out (√)
H7: Female-headed household => never school and drop-out (+)	❖ Both never attend and drop-out (√)
H8: School availability => never attend and drop-out (-)	❖ Never attend (√) but drop-out (X)
H1: Household SES => preschool enrollment (PE) (+)	❑ +√
H2. Wealthier community => PE (+)	❑ +√
H3. Household and community access to mass media => PE (+)	❑ +√
H4: Living in urban communities => PE (+)	❑ +√
H5. Household social capital (SC) => PE (+)	❑ Association +√
H6. Community SC => PE (+)	❑ Reciprocity +√
H7. Household SC compensates low income, education, media access on PE	❑ Social capital signified by reciprocity enables a low-income parent (+√).
H8. Community SC compensates household & community factors on PE	❑ Association and community trust (+√).
H1: Decentralization => progress in the mean length of schooling (+)	❖ Length of schooling (+√).
H2: Decentralization => municipal and provincial-level variations (+)	❖ It decreased province variation (+√) but it increased municipality variation (-√).
H3: Fiscal capacity, urbanization, municipality proliferation=> mean year of schooling (+)	❖ Development and urbanization (+√) but fiscal capacity and created new municipality (X)
H1: Attending in private madrasah => achievement (-)	❑ X
H2: Attending in Integrationist stream => achievement (+)	❑ √
H3a: Attending in private madrasah => gender achievement gaps (+)	❑ Mixed results (Science √ but English X)
H3b: Attending in Integrationist stream => gender achievement gaps (+)	❑ √
H3a: Attending in private madrasah => SES achievement gaps (+)	❑ √ in Science
H3b: Attending in Integrationist stream => SES achievement gaps (+)	❑ X
	❑ School tracks and streams play important roles after student and family factors.

6.3 Theoretical implications

A resource-based approach highlights the importance of the relation between various types of resources and educational outcomes and inequality (Al-Samarrai, 2013; Suryadarma, 2010; Hanushek, 2007; Newhouse & Beegle, 2006; Barro & Lee, 2001). Resources can originate in various levels, ranging from the individual to the government level. This study builds on and extends previous studies by using a multilevel multi-resources framework to systematically address the effects of differences in resources at various levels on educational attainment.

Our four studies suggest that various resources at the individual, household, community and government level explain inequality in education outcomes and show under which condition resource deficiency can be compensated by access to resources of another type or from another level. Table 6.2 summarizes the findings in this dissertation in terms of the inter-relationship between economic, human, social, physical, and municipality resources and inequality of educational outcomes across level of individual, household, school, community and municipality.

Table 6.2 Summary of the effects of different types of resources across different levels on educational outcomes in Indonesia in this dissertation

Capital➲ Level	**Economic**	**Human**	**Social**	**Infrastructure**	**Political**
National					Policy to decentralize education [Mixed]
Municipal	▪ Wealth [+] ▪ Household educ. expenditure [Mixed] ▪ Public educ. expenditure [Mixed] ▪ Poverty rate [Mixed] ▪ Fiscal capacity [0]	▪ Well-educated parents [0]	▪ Type and level of develop-ment [+] ▪ Urbani-zation [+]	▪ Number of schools [Mixed] ▪ School availability [Mix]	▪ Newly created municipality [0]
Village	▪ Mean of wealth		▪ Association [0] ▪ Trust [0] ▪ Reciprocity [+] ▪ Urbani-zation [+]	▪ School availability [+] ▪ Access to mass-media [+]	
School	▪ Teaching time [+] ▪ Teacher selection [Mixed] ▪ Financial support to students [Mixed]	▪ Well-educated parents [+] ▪ High-status parental job [+] ▪ Teacher training [Mix]			
Household	▪ Wealth [+] ▪ Educ. expenditure [+] ▪ Poverty [-]	▪ Head of household education [+] ▪ Parent education [+]	▪ Association [+] ▪ Trust [0] ▪ Reciprocity [+].	▪ Access to mass-media [+]	
Interactions: 1. *within level cross resource*	▪ Parent wealth * Reciprocity [- for highest income and + for lowest income]				
2. *between level single resource*	▪ Madrasah (mostly served poor children) * Municipality with high poverty rate [-] ▪ Urbanization * social capital (community association) [+] ▪ Urbanization * social capital (community reciprocity) [-]				
3. *between level cross resource*	▪ Household social capital (association) * community social capital (trust) [+]				

Overall, our multilevel multi-resources framework and the related findings lead to the following conclusions. *First*, our findings are in line with the resource-based approach (Barney, 1991) that stipulates that diverse resources at different levels affect educational outcomes. As our multilevel analyses show, economic, physical (infrastructure), human, social and political capital at different levels affect unequal access to and quality of education.

Second, the presence of more resources available across levels helps improve educational outcomes. However, these resources affect inequality in educational outcomes differently and sometimes they even each other out. For instance, municipality education expenditure significantly reduces dropout rates, but it does not significantly decrease children's likelihood of never attending school. Living in an urbanized area significantly amplifies the effect of community associations on preschool participation, but it significantly reduces the effects of community reciprocity on preschool participation.

Third, next to well-known economic and human capital resources at the household level, such as parents' income and educational background, this dissertation shows that also political resources at the national level - through the implementation of a decentralized education system - contribute to education outcomes. Furthermore, at the organizational level, ideological and organizational differences in private Islamic schools (represented by the different streams and tracks) influence student achievement and achievement gaps.

Fourth, our study presented three types of interplay between levels and types of resources that can contribute to or help remedy inequality in access to and quality of education in Indonesia. For instance, *within-level cross-resource effects* showed that reciprocity at the household level can buffer deficiencies in economic resources in relation to preschool participation. *Between-level single-resource effects* showed that the effect of association on preschool participation becomes stronger if the household lives in a community with high trust. In addition, higher investments in teaching time and teacher quality in the Integrationist schools can narrow student achievement gaps, which reflect *between-levels and cross-resource effects*.

6.4 Methodological implications

Unlike in developed countries, data on inequality in access to and quality of education in Indonesia is still limited and scattered across institutions. Other data challenges relate to missing data as well as differences in labels and inconsistency in data coding. In our study, we handled these challenges by merging different data sources and linking the data in terms of different types of resources and levels. We also identified for what time period each data source is available and whether the variables and periods are comparable.

Furthermore, we conducted some interviews and did data confirmation checks with the leaders of education organizations to verify our own coding and categorizations.

Linking, merging and confirming these different sources enabled us to simultaneously investigate the effects of various types of resources across different levels on inequality of access to and quality of education. Multilevel analyses allowed us to study variations in each level and to identify interplays within and between levels.

A limitation of our study is that it had to rely on (repeated) cross-sectional data. As a result, we cannot draw conclusions about the causal relations linking resources and inequality in educational outcomes. Future research might benefit from conducting longitudinal studies with more fine-grained variables, such as comparing students' achievement before entering school, and after one and two years of learning at different types of schools. Such research designs would allow a more detailed reconstruction of the social mechanisms linking the availability or lack of resources to educational decision making at the level of the household, and its collective level outcomes.

Finally, with this study being limited to a single country, the findings cannot be generalized to other countries. Nevertheless, the framework and findings may be useful for comparative studies addressing *countries* with similar geographical and infrastructural challenges.

6.5 Practical implications

Education empowers people, and persistent inequality in educational systems and outcomes are a major concern in most countries. Our study provides *some insight* into potential points of departure for addressing inequality in access to and quality of education in the Indonesian context. This study corroborates results of previous studies, according to which difference in resources affects variations in educational outcomes (see e.g. Suharti, 2013; Suryadarma, 2010; Newhouse & Beegle, 2006). Our results provide at least two important new understandings of practical relevance.

Firstly, the strong positive effects of household wealth and parents' educational level suggest that deficiencies in financial and human capital keep children out of school. Therefore, one could consider the use of direct financial support as well as other direct interventions, to help children living in poor households, in particular female-headed households. Government interventions may need to shift gradually from providing institutional support at the national or regional level to lower level institutions, such as municipalities and schools, or even directly to households and children, or to apply solutions at both institutional and individual levels simultaneously.

Secondly, it has long been contended that allocating resources to public education expenditures, such as teachers, classrooms, materials and others, is an important instrument to reduce inequality in educational outcomes (see e.g. Zhang & Kanbur, 2003; Sylwester, 2002). In addition to public education investments, our findings suggest that

social capital can contribute to improve preschool participation and reduce unequal access to education. Therefore, common policy interventions to remedy inequality by removing school fees for compulsory education, increasing government investments, providing incentives for low-income and underprivileged groups, and supporting education quality and efficiency (UNESCO, 2009), can benefit from incorporating social capital as an additional resource in both household and community levels.

Thirdly, given that this dissertation mainly focused on the decentralized education system in Indonesia, its results tap into debates about how to define the role of the central, provincial, and municipal levels in handling educational service delivery with the aim of reducing regional discrepancies. Our study shows that government attention, from a national perspective, seems especially needed to improve schooling in rural areas and less developed municipalities.

Lastly, our results indicate that government attempts to improve Islamic private schools (since they perform less well than public schools) can best be focused on the Traditionalist and Modernist streams. Both streams predominantly serve children from low SES parents, and are thus associated with limited parental resources, leading in turn to inadequate school incomes. In addition, the presence of Modernist schools in all provinces and almost all municipalities indicates that they reach diverse groups of students across the country, including remote areas where public schools do not exist. Therefore, improving the quality of Modernist and Traditionalist schools could lead to improved quality of learning for underprivileged and underserved students.

Overall, we found that municipal-level variation in educational inequality increased after decentralization. This suggests that policy makers need to realize that a "one size fits all policy" is difficult to apply in such diverse contexts. Consequently, it is recommended that policy makers, before implementing new policies and measures, take their time to carefully consider the contextual conditions in which these policies might work well and less well.

References

Admassie, A. (2003). Child labour and schooling in the context of a subsistence rural economy: can they be compatible? *International Journal of Educational Development*, 23(2): 167-185.

Afrianto. (2008). Reformulation of national examination policy in Indonesia http://adsindonesia.or.id/alumni/ASAC2008Papers/Afrianto-paper.pdf accessed on 30 August 2016.

Ainsworth, M., Beegle, K., & Koda, G. (2005). The impact of adult mortality and parental deaths on primary schooling in North-Western Tanzania. *The Journal of Development Studies*, 41(3): 412-439.

Albouy, V., & Lequien, L. (2009). Does compulsory education lower mortality? *Journal of Health Economics 28(1),* 155-168.

Alderman, H. (2006). *Improving Nutrition through Community Growth Promotion: Longitudinal Study of the Nutrition and Early Child Development Program in Uganda.* Development Research Group, World Bank. Washington, D.C.

Alisjahbana, AS . (1999). Does demand for children's schooling quantity and quality in Indonesia differ across expenditure classes?, *Journal of Population - Jakarta*, *vol. 5*, no. 1, pp. 87–114.

Allensworth, E.M. (2005). Dropout rates after high-stakes testing in elementary school: A study of the contradictory effects of chicago sports to end social promotion. *Educational Evaluation and Policy Analysis 27(4),* 341-364.

Al-Samarrai, S. (2013). *Local Governance and Education Performance : A Survey of the Quality of Local Education governance in 50 Indonesian Districts,* World Bank Other Operational Studies 16765, The World Bank.

Amin, S., & Suran, L. (2005). *Program efforts to delay marriage through improved opportunities: some evidence from rural Bangladesh.* Presented at the 2005 Annual Meeting of the Population Association of America, Philadelphia, Pennsylvania, March 31 - April 2, 2005.

Anderson, D.M. (2010). *In school and out of trouble? The minimum dropout age and juvenile crime*. University of Washington.

Anggraeni, L. (2009). Factors influencing participation and credit constraints of a financial self-help group in a remote rural area: The case of ROSCA and ASCRA in Kemang Village West Java. *Journal of Applied Sciences, 9: 2067-2077.*

Arina, S.N. (2011). *The effect of change in compulsory education on affecting birth weight*. Tilburg University 2011.

Armecin, G., J.R. Behrman, P. Duazo, S. Ghuman, S. Gultiano, E.M. King & N. Lee. (2006). *Early childhood development through an integrated program: evidence from the Philippines*. Policy Research Working Paper 3922. Washington DC: World Bank.

Arnold, C., Bartlett, K., Gowani, S., & Merali, R. (2006). *Is everybody ready? Readiness, transition and continuity. Reflections and moving forward*, commissioned for the EFA Global Monitoring Report 2007, Strong Foundations: Early Childhood Care and Education.

Arrow, K. (1999). Observations on social capital, in Dasgupta, P. & Serageldin, I. (eds.) *Social capital: A multifaceted approach*. Oxford University Press.

Arunatilake, N. (2006). Education participation in Sri Lanka: Why all are not in school. *International Journal of Educational Research*, 45 (3): 137-152.

Astone, N. M., Constance A. Nathanson, Robert Schoen, & Young J. Kim. (1999). Family demography, social theory, and investment in social capital. *Population and Development Review* 25(1): 1-31.

Attwood, G., & Croll, P. (2006). Truancy in secondary school pupils: prevalence, trajectories and pupil perspectives. *Research Papers in Education 21(4),* 467-484.

Badan Perencanaan Pembangunan Nasional (Bappenas). (2015). *Data dasar pendidikan*.

--------. (2016). *Perencanaan strategis pembangunan pendidikan di dalam RPJMN 2015-2019*. 29 February 2016.

Bardhan, P. (2002). Decentralization of governance and development. *Journal of Economic Perspectives. Volume 16*, Number 4/Fall 2002, p.185–205.

Barnett, W.S., & Yarosz, D. (2007). Who goes to preschool and why does it matter? *Preschool Policy Matters, Issue 15*. New Brunswick: Rutgers, The State University of New Jersey, National Institute for Early Education Research.

Barney, J.B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, Vol.17, No.1, pp.99-120.*

Barro, R. J., Lee J.W. (2001). International data on educational attainment updates and implications. *Oxford Economic Papers 53 (3): 541-63*.

Barro, R.J., & Lee, J.W. (2010). A new data set of educational attainment in the World, 1950-2010. *National Bureau of Economic Research, Working Paper 15902*. Cambridge, MA.

Barrera-Osorio, F., Linden L.L. & Urquiola, M. (2008). *The effects of user-fee reductions on rnrollment: Evidence from a quasi-experiment*. Columbia University Working Paper.

Barton, Greg. (2014). The Gülen Movement, Muhammadiyah and Nahdlatul Ulama: Progressive Islamic thought, religious philanthropy and civil society in Turkey and Indonesia. *Islam and Christian–Muslim Relations Vol.25/3*, pp 287-301. DOI: 10.1080/09596410.2014.916124.

Basic Education Capacity Trust Fund, BEC TF (2010). *The Indonesia local education governance index (ILEGI): A report card of 50 local governments*. Jakarta: MoEC, Kingdom of the Netherland, European Union, the World Bank.

Beard, V.A. (2005). Individual determinants of participation in community development in Indonesia. *Environment and Planning C: Government and Policy 23:21-39.*

Becker, G.S. (1991). *Treatise on the family*. Cambridge: Harvard University Press. Enlarged edition, 1991.

Becker, G.S. (1993). *Human capital: A theoretical and empirical analysis with special reference to education*. University of Chicago Press.

Becker, G.S., & Nigel, T. (1994). Human capital and the rise and fall of families, NBER Chapters, in: *Human capital: A theoretical and empirical analysis with special reference to Education (3rd Edition),* pages 257-298 National Bureau of Economic Research, Inc.

Berg-Schlosser, D. (2004). The quality of democracies in europe as measured by current indicators of democratization and good governance. *Journal of Communist Studies and Transition Politics, 20:1, p.28–55.*

Bernardo, A.B.I., Ganotice, F.A., & King, R.B. (2015). Motivation gap and achievement gap between public and private high schools in the Philippines. *The Asia-Pacific Education Researcher 24: 657*. doi:10.1007/s40299-014-0213-2

Besley, T., & Smart, M. (2007). Fiscal restraint and voter welfare. *Journal of Public Economics 91, p.755-773*.

Blau, F. D. & L. M. Kahn. (2005). Do cognitive test scores explain higher US wage inequality? *Review of Economics and Statistics 87, 184-193*.

Blau, P., & Duncan, O. (1967). *The American occupational structure*. New York: Wiley.

Blöndal, Hawkesworth, & Choi. (2009). Budgeting in Indonesia in *OECD Journal on Budgeting Vol.9/2009*.

Bourdieu, P. (1993). *Sociology in Question*. London: Sage.

Boyle, S., Brock, A., Mace, J., & Sibbons, M. (2002). *Reaching the poor: The 'costs' of sending children to school*. Synthesis Report. London: DFID.

Bowles, S. (1970). Towards an educational production function in W. Lee Hansen (Ed.). *Education, Income, and Human Capital*. NBER http://www.nber.org/chapters/c3276 Chapter pages in book: (p. 11 - 70)

Bracey, G. W. (2006). *Separate but superior? A review of issues and data bearing on single-sex education (EPSL-0611-221-EPRU)*. Tempe, AZ; Arizona State University, Education Policy Research Unit.

Brancati, D. (2006). Decentralization: Fueling the fire or dampening the flames of ethnic conflict and secessionism? in *International Organization, 60, 3:651*.685.

Braun, H., Jenkins, F., & Grigg, W. (2006). *Comparing private schools and public schools using hierarchical linear modeling (NCES 2006 - 461)*. U.S. department of education, National Centre for Education Statistics, Institute of Education Science. Washington, DC: U.S. Government Printing Office. Nces.ed.gov/nationsreportcard/pdf/studies/2006

Breen, R., Luijkx, R., Müller, W. & Pollak, R. (2009). Nonpersistent inequality in educational attainment: evidence from eight European countries, *American Journal of Sociology 114: 1475-521*.

Brooks-Gunn, J., & Duncan, G.J. (1997). The effects of poverty on children. *Future of Children, 7,* 55–71.

Browne, W.J., Charlton, C., Kelly, M. & Pillinger, R. (2014). *MCMC estimation in MLwiN version 2.31 (Updates for later versions)*. University of Bristol: Centre for Multilevel Modelling.

Bryner, Karen. (2013). *Piety projects: Islamic schools for Indonesia's urban middle class*. PhD Dissertation at Graduate School of Arts and Sciences, Columbia University.

Buchmann, C., & Brakewood, D. (2000). Labor structure and school enrollments in developing societies: Thailand and Kenya compared. *Comparative Education Review,* 44 (2), p.175–204.

Budihardjo, E. (2011). Kesenjangan pendidikan masalah serius di Indonesia. *Media Indonesia*, 4 Juli 2011.

Budiman, A. (1988). The emergence of the bureaucratie capitalist state in Indonesia, in Lim Teek Ghee (ed.). *Reflections on development in Southeast Asia,* p.110-29. Singapore: ISEAS.

Burhani, A.N. (2005). Revealing the Neglected Missions: Some Comments on the Javanese Elements of Muhammadiyah Reformism. *Studia Islamika*, 12 (1): 101-129.

Cameron, L. & Shah, M. (2012). *Can mistargeting destroy social capital and stimulate crime? Evidence from a cash transfer program in Indonesia*. IZA Discussion Paper No. 6736 July. The Institute for the Study of Labor (IZA): Bonn.

Cascio, E.U. & Schanzenbach, D.W. (2014). *Expanding preschool access for disadvantaged children*. http://www.brookings.edu/~/media/research/files/papers/2014/06/19_hamilton_policies_addressing_poverty/expand_preschool_access_cascio_schanzebach.pdf Retrieved July 23, 2015.

Central Bureau Statistics (CBS) of the Republic of Indonesia. (2005). *National socio-economic survey* 2005.

---------. (2009). *National socio-economic Survey* 2009.

--------. (2010). *National socio-economic Survey 2010*.

---------. *National socio-economic survey* 1996-1999 and 2007-2011.

Central Bureau Statistics (CBS) of the Republic of Indonesia. (2011). *Potential village 2011*.

Charlton, B. & Andras, P. (2003). *The Modernization imperative*. Imprint Academic: Exeter, UK. Pp. 85

Coates, D. (2003). Education production functions using instructional time as an input. *Education Economics, vol. 11, no. 3*.

Cohen, J.M., & Peterson, S.B. (1999). *Administrative decentralization: Strategies for developing countries*. West Hartford, USA, Kumarian Press, Inc.

Cohen, J.M., & Uphoff, N. (1997). *Rural development participation: Concepts measures for project design implementation and evaluation*. Inthado, NewYork, Cornell University.

Colclough, C., Rose, P., & Tembon, M. (2000). Gender inequalities in primary schooling: the roles of poverty and adverse cultural practice. *International Journal of Educational Development, 20*: 5–27.

Coleman, James S. (1988). Social capital in the creation of human capital, *American Journal of Sociology, Vol. 94*, Supplement: Organizations and institutions: Sociological and economic approaches to the analysis of social structure, pp. S95-S120.

Collier, Paul. (2002). Social capital and poverty: A microeconomic perspective, in Grootaert, Christiaan & Thierry van Bastelaer (Eds). 2002. The role of social capital in development – An empirical assessment, pp.19-41

Connelly, R., & Zheng, Z. (2003). Determinants of school enrollment and completion of 10 to 18 year olds in China. *Economics of Education Review*, *22*(4): 379-388.

Clark, R. L. (1992). *Neighborhood effects on dropping out of school among teenage boys*. Discussion paper. Washington, D.C.: The Urban Institute.

Crook, R., & Manor, J. (1998). *Democracy and decentralization in South Asia and West Africa: Participation, Accountability and Performance*. Cambridge, UK: Cambridge University Press.

Darling-Hammond, L. (2000).Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives, 8(1)*. Retrieved from http://epaa.asu.edu/epaa/v8nl.

Davis-Kean, E. P. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology,* 19(2), 294-304.

De Gregorio, J., & Lee, J. W. (2002). *Education and income inequality: New evidence from cross-country data*. *Review of Income and Wealth*, *48*(3), 395-416.

Deolalikar, A.B. (1997). *The determinants of primary school enrollment and household schooling expenditures in Kenya: do they vary by income?*, University of Washington. Mimeo.

Delamaza, G. (2014). *Enhancing democracy: Public policies and citizen participation in chile*. Berghanh, Oxford.

Devas, N. (2002). *Issues in fiscal decentralisation: Ensuring resources reach the (poor at) the point of service delivery*. Prepared for Workshop on Improving Service Delivery in Developing Countries. 24-30 November 2002. Eynsham Hall. DFID. International Development Department, School of Public Policy, University of Birmingham.

Devins, N. (1987). Centralization in education: Why Johnny can't spell bureaucracy, *California Law Review 759 Vol 75/2/8*. DOI: 10.15779/Z380T71.

Duncan, D., Featherman, D.L. & Duncan, B. (1972). *Socioeconomic background and achievement*. New York: Seminar Press.

Duncan, C.R. (2007). Mixed outcomes: The impact of regional autonomy and decentralization on indigenous ethnic minorities in Indonesia. *Development Change, 38(4), p.711-733*.

Duryea, S. (2003). School attendance, child labor and local labor market fluctuations in urban Brazil. *World Development*, *31*(7): 1165-1178.

Dolton, P., Marcenaro, O. & Navarro, L. (2003). The effective use of student time: a stochastic frontier production function case study, *Economics of Education Review, 22*.

Engle, P.L, Black, M.M, Behrman, J.R., Cabral de Mello, M., Gertler, P.J., Kapiri, L. (2007). Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. *The Lancet*, 369, 229–242.

Ersado, L. (2005). Child labor and schooling decisions in urban and rural areas: comparative evidence from Nepal, Peru, and Zimbabwe. *World Development*, *33*(3): 455-480.

Faguet, J.P., & Sanchez, F. (2006). *Decentralization's effects on educational outcomes in Bolivia and Colombia*. DEDPS working papers, 47. Suntory and Toyota International Centres for Economics and Related Disciplines, London School of Economics and Political Science, London, UK.

Fasang, Anette E., William Mangino, & Hannah Bruckner. (2010). *Parent social capital and educational attainment*. Center for Research on Inequalities and the Life Course, Working Paper.

Fatchiati, N. (2015). Dinamika Ujian Akhir dari masa ke masa. *Kompas, 15 April 2015*.

Featherstone, R. & Deflem, M. (2003). Anomie and strain: Context and consequences of Merton's two theories. *Sociological Inquiry*, Vol. 73, No. 4, November 2003, 471–89.

Figlio, D., Kenny, L. (2009). Public sector performance measurement and stakeholder support. *Journal Public Econonmy 93 (9–10)*, 1069–1077.

Filmer, D., & Pritchett, L.H. (2001). Estimating wealth effect without expenditure data or tears: An application to educational enrollments in atates of India. in *Demography* 38, no. 115-32.

Flap, H.D. & Völker, B.G.M. (2013). Social capital. In R. Wittek, T.A.B. Snijders & V. Nee (Eds.), *Handbook of rational choice social research (pp. 220-251) (32 p.)*. Stanford: Stanford University Press.

Fleras. (1994). Walking away from the camera: Minorities and the media in Canada, in *Ethnicity and Culture*, John Berry and Jean LaPonce, eds. Toronto: University of Toronto, 1993, pp. 312-41.

Flora, C.B. (1997). Enhancing community capitals: The optimization equation. *Rural Development News, The North Central Regional Center for Rural Development* 21(1): 1-3.

Friedkin, N.E. (1998). *A Structural theory of social influence*. New York, Cambridge University Press.

Fukuyama F. (1999). *Social capital and civil society*. The Institute of Public Policy, George Mason University, October 1, 99.

Galab, S., Vennam, U., Komanduri, A., Benny, L. & Georgiadis, A. (2013). *The impact of parental aspirations on private school enrolment: Evidence from Andhra Pradesh, India*. Young Lives: Oxford.

Galbraith, J.K. (2007). Global inequality and global macroeconomics. *Journal of Policy Modeling, 29, 587-607.*

Galiani, S. & Schargrodsky, E. (2002). Evaluating the impact of school decentralization on education quality. *Economia, vol. 2 (2), p.275-314.*

Gangl, M. (2002). Changing labor market and early career outcomes: Labour market entry in Europe over the past decade. *Work Employment Society 16*(1), 67-90.

Gazali, E., d'Haenens, L., Hollander, E., Menayang, V. & Nur Hidayat, D. (2003). Establishing a middle ground for public and community broadcasting in Indonesia: an action research project, *Communications, 28 (2003): 475-492*.

Ghozali, A, Mudjahid A. K., Hayati, M. (2013). *Madrasah education financing in Indonesia. Education Sector Analytical and Capacity Development Partnership (ACDP)* Agency for Research and Development (BALITBANG), Ministry of Education and Culture.

Gitter, S. R., & Barham, B. L. (2007). Credit, natural disasters, coffee and educational attainment in rural Honduras. *World Development, 35*(3), 498–511.

Glaeser, EL. & Redlick, C. (2008). *Social capital and urban growth*. NBER Working Paper Series. National Bureau of Economic Research.

Grant, M., & Hallman, K. (2006). *Pregnancy related school dropout and prior school performance in South Africa*. Policy Research Division Working Paper No 212. New York: Population Council.

Grave. B.S. (2010). *The effect of student time allocation on academic achievement*. Ruhr Economic Papers #235. Ruhr-Universität Bochum (RUB), Department of Economics.

Grootaert, Christiaan. (1999). *Social capital, household welfare, and poverty in Indonesia*. Washington, DC: The World Bank (Local Levels Institutions, Working Paper No. 6).

Grootaert, C. & van Bastelaer. (2002). *Understanding and measuring social capital: A multidisiplinary tool for practitioners*. Washington: World Bank.

Gurian, M., & Henley, P. (2001). *Boys and girls learn differently! A guide for teachers and parents*. San Francisco: Jossey-Bass.

Habibi, N., Huang, C., Miranda, D., Murillo, V., Ranis, G., Sarkar, M. (2001). *Decentralization in Argentina. Economic Growth*. Center Discussion Paper 825, Yale University.

Halim, A. (2004). *Bunga rampai manajemen keuangan daerah*. UPP AMP YKPN. Yogyakarta.

Handa, S. (1999). *Raising primary school enrollment in Developing Countries: The relative importance of supply and demand.* Food Consumption and Nutrition Division, International Food Policy Research Institute.Washington, D.C.

Hanushek, Eric A. (2003). The failure of input-based schooling policies. *Economic Journal 113, no.485 (February):*F64-F98.

--------. (2006). School resources, in E. A. Hanushek and F. Welch (eds) *Handbook of the economics of education (Vol. 2).* Amsterdam: Elsevier.

--------. (2007). *Education production functions*. Palgrave Encyclopedia. Hoover Institution, Stanford University

Haryanto, A. (2010). *Improving service quality of district education office (DEO) in Indonesia decentralized education system*. Dissertation in RMIT Australia.

Harmantyo, D. (2011). *Desentralisasi,otonomi,pemekaran daerah dan pola perkembangan wilayah di Indonesia*. Seminar Nasional dan PIT-IGI, Bali 22-23 Oktober 2011.

Hasan, A., Hyson, M. & Chang, M.C. (eds.). (2013). *Providing and evaluating services for low income young children*. The World Bank.

Hasan, N. (2009). Islamizing formal education: Integrated Islamic school and a new trend in formal education institution in Indonesia, *RSIS Working Paper 172*. Singapore: Rajaratnam School of International Studies.

Haveman, R.H., & Wolfe, B. (1994). *Succeeding generations: On the effects of investments in children*. New York: Russell Sage Foundation.

Hayek, F.A. (1948). *Individualism and economic order*. Chicago: University of Chicago Press.

Henry, K.L. (2007). Who is skipping school: characteristics of truants in 8th and 10th grade. *Journal of School Health 77(1),* 29-35.

Heredia-Ortiz, E. (2007). The Impact of education decentralization on education output: A cross-country study. George State University: *Economics Dissertations* Paper 21.

Hofferth, S., Boisjoly, J., & Duncan, G. (1998). Parents' extrafamilial resources and children's school attainment. *Sociology of Education*, 71, 246-268.

Hofman, B., & Kaiser, K. (2006). Decentralization, democratic transition, and local governance in Indonesia. In Pranab Bardhan & Dilip Mookherjee (eds.), *Decentralization and local governance in developing countries*. Cambridge: The Massachusetts Institute of Technology Press.

Hoover, S. 1993. What do we do about the media? *The Conrad Grebel Review (University of Waterloo, Ontario)* Vol. 11, No. 2, (Spring, 1993), pp. 97-108.

Hox, J. 2010. *Multilevel analysis: Techniques and applications, second edition.* New York: Routledge.

Huisman, J., & Smits, J. (2009). Effects of household- and district-level factors on primary school enrollment in 30 Developing Countries, *World Development, Vol. 37*, No. 1: pp. 179-193.

Hull, T. (2013). *Indonesian national socio-economic survey 2011: A user's guide to data files*. ADSRI, The Australian National University (ANU).

Hunter, N., & May, J. (2003). Poverty, shocks and school disruption episodes among adolescents in South Africa. *CSDS Working Paper, No. 35*.

Irwanto, Pandia, W.S.S., Widyawati, Y., & Irwan, A.Y.S. (2011). *School readiness evaluation*. Jakarta: UNICEF & Atma Jaya Indonesia Catholic University.

Ishomuddin. (2014). Construction of socio-cultural and political orientation of the followers Muhammadiyah and Nahdlatul Ulama (NU) in the Post Reform era in East Java Indonesia. *Global Journal of Politics and Law Research Vol.2, No.2*, pp.39-51.

Isolated Children's Parents' Association (ISPA) Qld Inc. (2013). *Australian Education Bill 2012 - Submission 3*.

Jeffrey, C., Jeffery, R. & Jeffery, P. (2008). School and madrasah education: gender and the strategies of Muslim young men in rural north India. *Compare: A Journal of Comparative and International Education, 38:5*, 581-593, DOI: 10.1080/03057920802351358.

Jencks, C., & Mayer, S.E. (1990). The social consequences of growing up in a poor neighborhood. In L. Lynn Jr. & M. G. H. McGeary (Eds.), *Inner-city poverty in the United States*. Washington D.C.: National Academy Press.

Jeon, S. (2011). Mechanisms of labor transition during agricultural transformation: The cases of South Korea and Indonesia. *International Conference on Asia Agriculture and Animal IPCBEE vol.13*. IACSIT Press, Singapore.

Johnson, C. (2001). Local democracy, democratic decentralisation and rural development: Theories, challenges and options for policy. *Development Policy Review* 19(4), p.521–32.

Johansone, I. (2010). *Achievement Equity by Urbanization in Latvia's Primary Education—Analysis of PIRLS 2006 and TIMSS 2007 Data*. TIMSS & PIRLS International Study Center, Boston College.

Johansson, K., Hasselberg, M., Laflamme, L. (2010). Young adolescents' independent mobility, related factors and association with transport to school. A cross-sectional study. *BMC Public Health, 10:635*.

Juneja, N. (2001). *Primary Education for All in the City of Mumbai, India: The challenge set by local actors. School mapping and local-level planning*. Paris: UNESCO.

Kaiser, K., Hofman, B., Kadjatmiko., Suharnoko, B.S. (2006). Evaluating Fiscal Equalization in Indonesia, *The World Bank Research Working Papers,* 1, 1- 36.

Kafir, K. (2007). Taking the boy crisis in education seriously: how school choice can boost achievement among boys and girls (PDF). *Independent Women's Forum*.

Kaufmann, D., Kraay, A., Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators for 1996-2008*. World Bank Policy Research Working Paper No. 4978. Washington, D.C.

Kennedy, E., & Peters, P. (1992). Household food security and child nutrition: the interaction of income and gender of the household head, *World Development, 20*(8): 1077–85.

Kessides, C. (2005). *The contributions of urban development to economic growth and poverty reduction in Sub-Saharan Africa*. Transport and Urban Development Department, The World Bank.

King, E.M., & Lillard, L.A. (1983). *Determinants of schooling attainment and enrollment rates in the Philippines*, Rand Report N-1962-AID.

Kingham, Robert & Jemma Parsons. (2013). Integrating Islamic schools into the Indonesian National Education System: A case of architecture over implementation in Daniel Suryadarma and Gavin W. Jones (eds) *Education in Indonesia pp 68-81*. Singapore: ISEAS.

Klein, S. (2011). The availability of neighborhood early care and education resources and the maltreatment of young children. *Child Maltreatment*, 16 (4), 299–310.

Knack, S. (2002). Social capital and the quality of government: Evidence from the U.S. States. *American Journal of Political Science 46(4): 772–785.*

Knight, J., & Song L. (2000). *Differences in educational access in rural China.* Working paper, Department of Economics, University of Oxford.

Kozol, J. (2006). *The shame of the nation: the restoration of apartheid schooling in America* (1st ed.). New York: Three Rivers Press.

Kristiansen, S., & Pratikno. (2006). Decentralising education in Indonesia. International *Journal of Educational Development 26, p.513-531.*

Kumari, R. (1989). *Women-headed households in rural India*, New Delhi: Radiant Publishers.

Lasagni, A & Lollo, E. (2011). Participation in rotating savings and credit associations in Indonesia: New empirical evidence on social capital in *Economia e Politica Economica Working Paper 5/2011.*

Levin, H.M. (1987). *New schools for the disadvantaged.* U.S. Department of Education. Educational Research and Improvement.

Litvack, J., Junaid, A., Richard, B. (1998). *Rethinking decentralization in developing countries*. World Bank Sector Studies Series. Washington, D.C. : The World Bank.

Lin, N. (2001). Social capital. *A theory of structure and action.* Cambridge: Cambridge University Press.

Lindsey, D. (1994). *The welfare of children*. Oxford University Press, New York.

Liu, F. (2004). Basic education in China's rural areas: a legal obligation or an individual choice? *International Journal of Educational Development, 24*: 5-21.

Lleras-Muney, A. (2005). The relationship between education and adult mortality in the United States. *Review of Economic Studies 72,* 189.221.

Lloyd, C.B., & Blanc, A.K. (1995). *Children's schooling in sub-Saharan Africa: The role offathers, mothers, and others.* Research Division Working Paper No. 78. New York: The Population Council.

Louis, K.S., Dretzke, B., & Wahlstrom, K. (2010). How does leadership affect student achievement? Results from a national US survey. *School Effectiveness and School Improvement, 21(3),* 315336.

Lucas, K.(ed). (2004). *Running on empty: Transport, social exclusion and environmental justice.* Bristol: The Policy Press.

Lundine, J., Hadikusumah, R.Y., Sudrajat, T. (2013). Indonesia's Progress on the 2015 MDGs. *Strategic Review. pp.54-66. September 2013.Vol.3. Number 3.* Jakarta:The Indonesian Journal of Leardership, Policy, and World Affairs.

Lustig, N. (2015). *Inequality and fiscal redistribution in middle income countries: Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa*. CGD Working Paper 410. Washington, DC: Center for Global Development.

Lynch, K., & Baker, J. (2005). Equality in education. An equality of condition perspective. *Theory and Research in Education, 3 (2), 131-164.*

Machin, S., & Pekkarinen, T. (2008). Global sex differences in test score variability. *Science, 322,* 1331–1332.

Mackie, J., & MacIntyre, A. (1994). Politics, in Hal Hill (ed.), *Indonesia's New Order: The dynamics of socio-economic transformation.* Sydney: Allen & Unwin (1-53).

Madeira, R.A. (2012). *The effects of decentralization on schooling: Evidence from the Sao Paulo State's education reform*. Working Paper No. 26 Department of Economics, University of Sao Paulo.

Manor, J. (1999). *The political economy of democratic decentralization*. Washington DC: The World Bank.

Manski, C.F., Sandefur, G.D., McLanahan, S. & Powers, D. (1992). Alternative estimates of the effect of family structure during adolescence on high school graduation. *Journal of the American Statistical Association 87 (March): 25-37.*

Matta, JR. & Alavalapati, JRR. (2006). Perceptions of collective action and its success in community based natural resource management: An empirical analysis. *Forest Policy and Economics 9: 274-284.*

Mawhood, P. (1983). *Local government in the Third World*. Chichester: John Wiley.

Millie, J. (2013). The situated listener as problem: 'Modern' and 'traditional' subjects in Muslim Indonesia. *International Journal of Cultural Studies May 2013 vol. 16 no. 3 271-288*. doi:10.1177/1367877912474536

McCulloch, N., & Grover, A. (2010). *Estimating the national impact of the financial crisis in Indonesia by combining rapid qualitative study with national representative surveys.* Institute of Development Studies.

McLanahan, S. S., & Sandefur, G. (1994). *Growing up with a single parent: What hurts, what helps*. Cambridge, MA: Harvard University Press.

McLuhan, M. (1964). *Understanding media: The extensions of men*. New York: McGraw-Hill.

McNeal, R.B. (1999). Parental involvement as social capital: Differential effectiveness on science achievement, truancy, and dropping out. *Social Forces, 78,*117-144.

Merton, R.K. (1968). *Social theory and social structure. Enlarged Edition*. New York: The Free Press.

Merton, R.K. (1995). Opportunity Structure: The Emergence, Diffusion and Differentiation of a Sociological Concept, 1930's –1950's, pp. 3-78 in F. Adler & W.S. Laufer (eds.), *The Legacy of Anomie Theory*. London: Transaction Publishers.

Miguel, E., Gertler, P., & Levine, D.I. (2006). Does industrialization build or destroy social networks? *Economic Development and Cultural Change,* 54(2).

Ministry of Development of Disadvantaged Regions (MDDR). (2011). http://www.kpdt.go.id/hal/300027/183-kab-daerah-tertinggal. Accessed 27 February 2014.

Ministry of Finance (MoF). (2012). *Budget statistics*. Jakarta.

Ministry of Home Affair (MoHA). (2012). http://otda.kemendagri.go.id/images/file/data_dob/jumlah%20daerah%20otonom%20baru%202013.pdf. Accessed 27 February 2014.

Ministry of Education and Culture (MoEC). (2000). *Data pokok pendidikan 1999/2000 dan perkembangan sejak 1994/1995 (termasuk madrasah)*. Jakarta: Balitbang Depdiknas.

--------. (2009). *Buku panduan Bantuan Operasional Sekolah (BOS) untuk pendidikan gratis dalam rangka Wajib Belajar 9 tahun yang bermutu.*

--------. (2009). *Peraturan Menteri Pendidikan Nasional no 75 tahun 2009* http://www.depdiknas.go.id accessed on 30 August 2016.

--------. (2010). *Data pokok pendidikan.*

--------. (2013). *Kebijakan dan program pendidikan menengah tahun 2013.*

--------. (2013). *Micro-data of the national examination of the junior secondary school.*

Mladovsky, P. (2014). *Social capital and enrolment in community-based health insurance in Senegal.* PhD thesis, The London School of Economics and Political Science (LSE).

Mukudi, E. (2004). The effects of user-fee policy on attendance rates among Kenyan elementary schoolchildren. *International Review of Education*, *50*(5-6): 447-461.

Muller, C. (2001). The role of caring in the teacher-student relationship for at-risk students. *Sociological Inquiry,* 71(2), 241-255. doi:10.1111/j.1475-682X.2001.tb01110.x

Nachtigal, P. M. (1982). *Rural education: In search of a better way*. Boulder, CO: Westview Press.

Newhouse, David & Beegle, Kathleen. (2006). The effect of school type on academic achievement: Evidence from Indonesia, *Journal of Human Resources,* University of Winconsin Press, vol 41(3).

Nordholt, H. (2003). Renegotiating boundaries; Access, agency and identity in post-Soeharto Indonesia In: *Bijdragen tot de Taal-, Land- en Volkenkunde 159 (2003), no: 4,* Leiden, p.550-589.

Oates, W.E. (1972). *Fiscal federalism*. New York: Harcourt Brace Jovanovich.

OECD (2012). *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. http://dx.doi.org/10.1787/9789264130852-en

OECD/Asian Development Bank. (2015). *Education in Indonesia: Rising to the challenge*, OECD Publishing, Paris. *http://dx.doi.org/10.1787/9789264230750-en*

Oketch, M., & Rolleston, C. (2007). Policies on free primary and secondary education in East Africa: A Review of the Literature. *Create Pathways to access*. Brighton: University of Sussex, Research Monograph No. 10.

Palmer, M.D. & Burgess, S.M. (2012). A muslim modernist organization in contemporary Indonesia. Palmer, M.D. & Burgess, S.M. (Eds) *Religion and Social Justice*. Blackwell Publishing Limited. DOI: 10.1002/9781444355390.ch15

Palmier, Leslie H. (1954). Modern Islam in Indonesia: The Muhammadiyah after Independence. *Pacific Affairs 27, no. 3*: 256–263.

Pampel, F.C. (2000). *Logistic regression: A primer*. Thousand Oaks, CA: Sage Publications.

Paqueo, V., & Sparrow, R. (2005). *Free Basic Education in Indonesia: Policy scenarios and implications for school enrolment*. World Bank. Jakarta.

Parker, L & Raihani, R. (2009). Governing madrasah. *Policy Brief 4, Australia Indonesia Governance Research Partnership*, Canberra: Australian National University.

Permani, Risti. (2009). *The economic of Islamic education: Evidence from Indonesia*. PhD Dissertation, The University of Adelaide, Australia.

Perkins, H.W & Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions,* 21:961-976.

Piper, Bradley D. (2008). Attitudes, confidence, and achievement of high-ability fifth grade Math students. *Summative Projects for MA Degree. Paper 29.* http://digitalcommons.unl.edu/mathmidsummative/29

Pfeffer, F. T. (2008). Persistent inequality in educational attainment and its institutional context. *European Sociological Review*, 24(5): 543-565.

Pong, S.L., & Ju, D.B. (2000). The effects of change in family structure and income on dropping out of middle and high school. *Journal of Family Issues, 21,*147-169.

Powell, M.A., L. Parcel, T.L. (1997). Effects of family structure on the earnings attainment process: Differences by gender. *Journal of Marriage and the Family 59:419–33.*

Powdthavee, N. (2010). Does education reduce the risk of hypertension? Estimating the biomarker e¤ect of compulsory schooling in England. *Journal of Human Capital 4,* 173-202.

Pradhan, M., Brinkman, S.A., Beatty, A., Maika, A., Satriawan, E., de Ree, J., & Hasan, A. (2013). *Evaluating a community-based early childhood education and development program in Indonesia: study protocol for a pragmatic cluster randomized controlled trial with supplementary matched control group.* Trials,14(1), 259. doi:10.1186/1745-6215-14-259.

Prud'homme, R. (1995). *On the dangers of decentralization.* The World Bank Research Observer 10: 2.

Pryor, J., & Ampiah, J.G. (2003). *Understandings of education in an African village: The impact of information and communication technologies.* London: DFID.

Pusponegoro, N.H. (2013). Kemiskinan anak usia kurang dari lima tahun pada rumah tangga dengan rata-rata pengeluaran terletak pada kuantil pertama tahun 2008-2010 di Indonesia. SMERU. Jakarta.

Putnam, Robert. (2000). *Bowling alone: Civic disengagement in America* New York: Simon and Schuster.

Qibthiyyah, R.M. (2008). *Essays on political and fiscal decentralization.* Dissertation, Georgia State University. http://scholarworks.gsu.edu/econ_diss/55. Accessed 21 January 2015.

Rasbash, J., Fiona Steele, William J. Browne & Harvey Goldstein. (2014). *MLwiN manuals.* Centre for Multilevel Modelling, University of Bristol.

Rasbash, J., Fiona Steele, William J. Browne & Harvey Goldstein (2015). *A user's guide to MLwiN version 2.32.*Centre for Multilevel Modelling, University of Bristol.

Reardon, S.F. (2011). The widening socioeconomic status achievement gap: New evidence and possible explanations. In R.J. Murnane & G.J. Duncan (Eds.), *Whither Opportunity? Rising Inequality and the Uncertain Life Chances of Low-Income Children.* New York: Russell Sage Foundation.

Republic of Indonesia. (1945). *The Indonesia Constitution.*

----------. (1965). *Penetapan Presiden Republik Indonesia Nomor 19 Tahun 1965 tentang Pokok-Pokok Sistem Pendidikan Nasional Pancasila.*

----------. (1973). *Presidential Instruction No. 10/1973 on the Primary School Construction Program, INPRES SD.*

---------. (1993). *Lampiran Pidato Pertanggungjawaban Presiden/Mandataris Majelis Permusyawaratan Rakyat Republik Indonesia (MPR RI) di depan Sidang Umum MPR RI*. 1 Maret 1993.

---------. (1994). *Presidential decree No. 1/1994 on implementation of compulsory basic education*. Jakarta: Ministry of State Secretary.

---------. (1999). *Law No. 22/1999 on Regional government*. Jakarta: Ministry of State Secretary.

---------. (1999). *Law No. 23/1999 on Regional fiscal balance*. Jakarta: Ministry of State Secretary.

---------. (2003). *Law No.20/2003 on National education system*. Jakarta: Ministry of State Secretary.

---------. (2004). *Law No. 32/2004 on Regional government and Law No. 33/2004 on Regional fiscal balance*. Jakarta: Ministry of State Secretary.

Roberts, K. (2009). Opportunity structures then and now. *Journal of Education and Work Vol. 22*, No. 5, November 2009, 355-368.

Robison, L.J., Schmid, A.A., & Siles, M.E. (2002). Is social capital really capital? *Review of Social Economy*, 60: 1–21.

Rogers, E.M. (1995). *Diffusion of innovations (4th edition)*. The Free Press. New York.

Rondinelli, D.A., & Nellis, J.R. (1986). Assessing decentralization policies in Developing countries: A Case for Cautious Optimism. *Development Policy Review 4(1), p.3-23*.

Rose, P., & Al Samarrai, S. (2001). Household constraints on schooling by gender: Empirical evidence from Ethiopia. *Comparative Education Review*, *45*(1): 36-63.

Rumberger, R.W. (1995). Dropping out of middle school: A multilevel analysis of students and schools. American Educational Research Journal, 32*,* 583-625.

Rumberger, R.W. & Larson, K.A. (1998). Student mobility and the increased risk of high school drop out. *American Journal of Education, 107,* 1-35.

Rumberger, R.W. (2004). Why students drop out of school. In Gary Or.ed (Ed.), *Dropouts in America: Confronting the Graduation Rate Crisis*. Cambridge, MA: Harvard Education Press.

Saraswati, E. (2012). Public spending education and inequality: A case study in Indonesia. *International Journal of Social Science and Humanity, Vol. 2, No. 5, September 2012*.

Schweinhart, L.J., Montie, J., Xiang, Z., Barnett, W.S., Belfield, CR. & Nores, M. (2005). *Lifetime effects: The high/scope Perry preschool study through age 40*. Ypsilanti, MI: HighScope Press.

Self & Grabowski. (2008). Examining the link between Japan's development and education of females. *Pacific Economic Review* 13/3, p. 279-288.

Servaes, J. (ed.). (2008). *Communication for development and social change*. London: Sage.

Shahnaz, L., & Naeem, S. (2012). *Why children never attend school in Pakistan? Evidence from PSLM 2010-11*.

Shavit, Y. & Blossfeld, H.P. (eds.). (1993). Persistent inequality: Changing educational attainment in Thirteen Countries. Boulder: Westview Press.

Shindler, J. (2010). *Characteristics of out-of-school children of compulsory school age in South Africa: What the community survey 2007*. A 'Consortium for Research on Educational Access, Transitions and Equity (CREATE) working paper.

Sibanda, A. (2004). Who gets to drop out of school in South Africa? The role of individual and household attributes. *African Population Studies,* vol.19(1):99-117.

Sifuna, D.N. (2005). The illusion of universal free primary education in Kenya. *Wajibu, 20(4).*

Simatupang, R.R. (2009). *Evaluation of decentralization outcomes in Indonesia: Analysis of Health and Education Sectors*. Economics Dissertations.

Sjahrir, B.S., & Kis-Katos, K. (2011). *Does local governments' responsiveness increase with decentralization and democratization? Evidence from sub-national budget allocation in Indonesia*. University of Freiburg, Department of International Economic Policy .

Smart, D., Sanson, A., Baxter, J., Edwards, B. & Hayes, A. (2008). *Home-to-school-transitions for financially disadvantaged children*. Sydney: The Smith Family.

Smith, M.H., L.J. Beaulieu, & A. Seraphine. (1995). Social capital, place of residence, and college attendance. *Rural Sociology 60*:363–80.

Snijders, T.A.B., & Bosker, R.J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling (Second edition)*. London: SAGE publications Ltd.

Sobel, J. (2002). Can we trust social capital? *Journal of Economic Literature 40, pp. 139-54.*

Song, L. & Lin, N. (2009). Social capital and health inequality: Evidence from Taiwan. *Journal of Health and Social Behavior* 50(2): 149-63.

Song, L. (2009). The effect of the cultural revolution on educational homogamy in Urban China. *Social Forces* 88(1): 257-70.

Sparrow, R. (2007). Protecting education for the poor in times of crisis: An evaluation of a scholarship program in Indonesia. *Oxford Bulletin of Economics and Statistics 69(1), 2007, 99-122*.

Stansfeld, S.A. (2006). Social support and social cohesion. In: Marmot M, Wilkinson R, editors. *Social determinants of health*. Oxford University Press; Oxford. pp. 148–171. 2eds.

Stearns, Moller, Blau, & Potochnick. (2007). Staying back and dropping out: The relationship between grade retention and school dropout in *Sociology of Education July 2007 vol. 80* no. 3 210-240.

Stinebrickner Ralph & Stinebrickner Todd R., (2008). The causal effect of studying on academic performance, *The B.E. Journal of Economic Analysis & Policy, De Gruyter,* vol. 8(1), pages 1-55, June.

Stoet, Gijsbert & Geary, David, C. (2013). Sex differences in Mathematics and Reading achievement are inversely related: Within- and across-nation assessment of 10 years of PISA data. *PLoS ONE*, 2013; 8 (3): e57988 DOI: 10.1371/journal.pone.0057988

Subroto, P. (2007). *Financing education sector under the current decentralized system in Indonesia: Disparities in education expenditure per student at public junior secondary schools*. Dissertation, University of Pittsburgh.

Suharti. (2013). Trends in education Indonesia in D. Suryadarma & G.W. Jones (Eds) *Education in Indonesia*. Singapore: Institute of Southeast Asian Studies (ISEAS).

Suharto, Toto. (2014). Gagasan pendidikan Muhammadiyah dan NU sebagai potret pendidikan Islam moderat di Indonesia. *ISLAMICA, Volume 9, Nomor 1.*

Sumarto, S., Suryahadi, A. & Widyanti, W. (2002). Designs and implementation of the Indonesian social safety net programmes. *Developing Economies, 40(1), pp. 3–31.*

Sumarto, S., Suryahadi, S. & Arifianto, A. (2004). *Governance and poverty reduction: Evidence from newly decentralized Indonesia. SMERU Working Paper*. Jakarta: SMERU Research Institute.

Suliman, E.A., & El-Kogali, S.E. (2010). *Why are the children out of school? Factors affecting children's education in Egypt*.

Suryadarma, D. (2010). *The Muslim disparity in education attainment: Explanations from Indonesia*. Arndt-Corden Department of Economics Crawford School of Economics and Government Australian National University.

Suryadarma, D. (2012). How corruption diminishes the effectiveness of public spending on education in Indonesia, *Bulletin of Indonesian Economic Studies*, Taylor & Francis Journals, vol. 48(1), pages 85-100, April.

Sylwester, K. (2002). Can education expenditures reduce income inequality? *Economics of Education Review 21 (2002) 43–52*.

Teachman, J.D., Paasch, K., & Carver, K. (1996). School capital and dropping out of school. *Journal of Marriage and the Family , 58,* 773-783.

Temple, P. (2007). *Learning spaces for the 21st century: A review of the literature*, Centre for Higher Education Studies, Institute of Education, University of London.

Tim Penyusun Lintas Kementrian dan Lembaga. (2007). *Pedoman umum Program Keluarga Harapan (General guidelines of Household Conditional Cash Transfer 2007)*. Jakarta.

Thachil, Tariq. (2014). *Elite parties, poor voters: How social services win votes in India*. Cambridge: Cambridge University Press.

Tiebout, C.M. (1956). A pure theory of local expenditures. *Journal of Political Economy 64, p.416-424*.

Tobias, J., Wales, J., Syamsulhakim, E. & Suharti. (2014). *Towards better education quality: Indonesia's promising path*. London: ODI Development Progress.

Tommasi, M., & Weischelbaum, F. (1999). *A principal-agent building block for the study of decentralization and integration*. Working Paper No. 20, Department of Economics, Universidad de San Andre´s.

Treiman, D.J., & Ganzeboom, H.B.G. (1990). Cross-national comparative status attainment research. *Research in Social Stratification and Mobility, 9,* 105-127.

Treisman, D. (2000). *Decentralization and the quality of government*. Unpublished paper. www.polisci.ucla.edu/faculty/treisman/. Accessed 27 February 2014.

Van Damme & Miyamoto. (2010). *Social capital, human capital and health: What is the evidence?* OECD.

United Nations Development Program (UNDP). (1999). *Decentralization: A sampling of definitions*. Working paper prepared in connection with the Joint UNDP-Government of Germany evaluation of the UNDP role in decentralization and local governance.

--------. (2002). *Human development report: Deepening democracy*. Oxford, New York: The United Nations Development Programme.

United Nations Children's Fund (UNICEF). (2004). *First steps Maldives evaluation of ECCD media campaign*. Male, UNICEF Maldives.

------. (2006). *The state of the World's children 2006: Excluded and invisible*. UNICEF, New York.

------. (2006). *Programming experiences in early child development*. New York: USA. United Nations Educational, Scientific and Cultural Organization, EFA Global Monitoring Report. 2007. *Strong foundations – Early childhood care and education*, UNESCO, Paris, 2007.

--------. (2015). *The investment case for education and equity*. Education Section, Programme Division: New York.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2005). *Children out of school: Measuring exclusion from primary education*. Montreal: Institute for Statistics.

--------. (2008). *Inclusive education: the way of the future*. International Conference Centre, Geneva 25-28 November 2008. Institute for Statistics

--------. (2009). *Education Indicators: Technical guidelines*. Institute for Statistics.

--------. (2011). http://unesdoc.unesco.org/images/0019/001921/192183e.pdf. Accessed 21 January 2015.

Uphoff, N. (1997). *Institutional capacity and decentralization for rural development*. Technical Consultation on Decentralization. Rome.

USAID. (2007). *Analysis of current situation of Islamic formal junior secondary education in Indonesia*.

Usman, S. (2001). *Indonesia's decentralized policy: Initial experiences and emerging problems*. Paper presented at the European Southeast Asian Studies Conference, London: SOAS, September.

Wenger, J. (2002). Does the dropout age matter? How mandatory schooling laws impact high school completion and school choice. *Public Finance and Management 2(4),* 507-543.

Wernerfelt B. (1984). The resource-based view of the firm. *Strategic Management Journal.* **5** (2): 171–180.

White, M.J. & Kaufman, G. (1997). Language usage, social capital, and school completion among immigrants and native-born ethnic groups. *Social Science Quarterly* 78(2): 386-398.

Williamson, I.P., Rajabifard, A.,Enemark, S. (2003). *Capacity building for SDIs*. Proceedings of 16th United Nations Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14-18 July, E/CONF/95/1., 17p.

World Bank. (2003). *Decentralizing Indonesia: A regional public expenditure review overview report*. East Asia Poverty Reduction and Economic Management Unit, Jakarta.

--------. (2004). *World development report: Making services work for poor people*. World Bank, Washington DC.

--------. (2008). *Spending for development : making the most of Indonesia's new opportunities: Indonesia public expenditure review 2007.*

--------. (2013). *Local governance and education performance: A survey of the quality of local education governance in 50 Indonesian districts*. East Asia and Pacific Region Human Development.

Woodward, M., Rohmaniyah, I., Amin, A. & Coleman, D. (2010). Muslim education, celebrating Islam and having fun as counter-radicalization strategies in Indonesia. *Perspectives on Terrorism* Vol 4, No 4 (2010).

Woodward, Kathleen E. (2015). Indonesian schools: Shaping the future of Islam and democracy in a democratic Muslim country. *Journal of International Education and Leadership Volume 5 Issue 1 Spring 2015*.

Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework in *Theory and Society 27(2):* 151-208.

Yonezawa, A. & Muta, H. (2001). Financing junior secondary education in decentralised administrative structures: The Indonesian example. *Journal of International Cooperation in Education, Vol.4 No.2 (2001)* pp.109~124.

Yuniarti, S.L. & Hakim, L. (2014). *The cabinet: Whither early childhood education?* in http://www.thejakartapost.com/news/2014/11/05/the-cabinet-whither-early-childhood-education.html#sthash.5D6kXXrC.dpuf

Zhang, X & Kanbur, R. (2003). *Spatial inequality in education and health care in China*.

http://data.worldbank.org/indicator/SE.PRE.ENRR accessed 7 November 2015.

http://data.unicef.org/education/secondary retrieved 08 August 2014http://www.bps.go.id/ accessed 27 February 2013.

https://unnes.ac.id/berita/diapresiasi-publik-raeni-peroleh-tawaran-beasiswa-s2-ke-inggris/ accessed on 31 August 2016.

http://www.bps.go.id/linkTabelStatis/view/id/1525 retrieved12 March 2014

http://www.djpk.depkeu.go.id retrieved 10 December 2013

http://www.muhammadiyah.or.id/content-8-det-amal-usaha.html accessed 9 December 2015.

http://www.maarif-nu.or.id/Profil.aspx accessed 9 December 2015.

Interviewees:

1. Dr. Mamat S. Burhanudin, M.Ag, Vice Chairman Central Office of Al-Maarif Nahdlatul Ulama (*Tradisionalist*).
2. Dr. Maskuri, M.Sc, Chairman Central Office of Council for Primary and Secondary Education Muhammadiyah (*Modernist*)
3. Sukro Muhab, Chairman Central Office of Jaringan Sekolah Islam Terpadu (JSIT) or Integrated Islamic School Networks (*Integrationalist*).

Nederlandse samenvatting

(Summary in Dutch)

Toegankelijk en kwalitatief hoogwaardig onderwijs is cruciaal voor economische groei en stabiliteit in landen. Toegankelijkheid en kwaliteit is echter niet voldoende zonder gelijkheid in het onderwijs. Individuen profiteren van gelijkheid in het onderwijs, niet alleen omdat het de inzetbaarheid op de arbeidsmarkt vergroot en tot een goed inkomen leidt, maar ook omdat het het kritisch- en probleem oplossend vermogen verbetert, wat helpt om goede keuzes te maken.

De Indonesische regering probeert om zowel de toegankelijkheid als de kwaliteit van het onderwijs voor haar burgers te vergroten, onder andere door het onderwijs te decentraliseren. Deze beleidsverandering heeft zichtbaar effect gehad. Desondanks zijn een aantal doelstellingen om de toegankelijkheid en kwaliteit van het onderwijs te verbeteren nog niet behaald, zodat onderwijsongelijkheid blijft voortbestaan.

Dit proefschrift onderzoekt het complexe en multidimensionale fenomeen van ongelijkheid in de toegankelijkheid en kwaliteit van het onderwijs in Indonesië. Het proefschrift presenteert analyses die gebaseerd zijn op een '*multilevel*' en '*multi-resource*' onderzoekskader. De bronnen voor het onderzoek betreffen verschillende nationale enquêtes, administratieve data en expert interviews met vertegenwoordigers van drie non gouvernementele koepels van private Islamitische scholen in Indonesië. Het onderzoeksdoel was steeds om de mechanismen verantwoordelijk voor de voortdurende onderwijsongelijkheid in Indonesië bloot te leggen. Dit onderzoek toont aan dat een complex samenspel van menselijk, sociaal, economisch, politiek en infrastructureel kapitaal aan deze ongelijkheid ten grondslag ligt. Deze factoren spelen een rol op en tussen verschillende niveaus, zoals het niveau van het individu, het huishouden, de school, de gemeenschap en de staat.

Het proefschrift bestaat uit vier empirische hoofdstukken die een aantal samenhangende onderzoeksvragen trachten te beantwoorden. Welke gemeentelijke, huishoudelijke en persoonlijke (kind) kenmerken voorspellen bijvoorbeeld schooluitval of dat kinderen nooit naar school gaan? In welke mate en onder welke omstandigheden zijn ouders geneigd hun kinderen naar peuterscholen te sturen, welke bronnen in het gezin en hun gemeenschappen zijn daarbij van belang, en wat is de specifieke invloed van sociaal kapitaal? In welke mate heeft de decentralisatie van het Indonesisch onderwijs invloed gehad op (variaties in) hoe lang leerlingen onderwijs volgen, geanalyseerd op het niveau van provincies en gemeenten? En hoe kunnen prestaties van leerlingen, alsmede

prestatieverschillen tussen jongens en meisjes en rijke en arme kinderen, verklaard worden door verschillen in de ideologische en organisationele kenmerken van private Islamitische scholen in Indonesië?

Hoofdstuk 2: Welke kind- en gezinskenmerken, en kenmerken van de gemeentelijke context waarin kinderen wonen, voorspellen waarom Indonesische kinderen nooit aan school beginnen of later uitvallen?

We onderzoeken de mate waarin gezins- en gemeentelijke eigenschappen samenhangen met de kans dat kinderen niet deelnemen aan onderwijs. Gebaseerd op een zogenaamde 'opportunity structure' benadering werken we het idee uit dat bepaalde gemeentelijke en huishoudelijke eigenschappen kinderen *belemmeren* dan wel *faciliteren* om naar school te (blijven) gaan gedurende het negenjarig verplichte onderwijssysteem. De hypothesen die op basis van deze ideeën zijn geformuleerd worden getest met data van 221,392 kinderen die zich in 136,182 huishoudens en 497 gemeenten bevinden. Een multi-level analyse van deze data laat zien dat investeringen in onderwijs op het niveau van gemeenten schooluitval kunnen tegengaan maar dat deze niet helpen om kinderen in eerste instantie naar school te krijgen. Andersom geldt dat de aanwezigheid van scholen in de omgeving van een kind bevordert dat kinderen in eerste instante naar school gaan, maar het kan schooluitval niet tegengaan. Kinderen die wonen in gemeenten met veel arme huishoudens hebben minder kans om ooit naar school te gaan, maar de kans dat zij stoppen met school is interessant genoeg lager. Eigenschappen van het huishouden, zoals het inkomen, de investering in onderwijs, en het opleidingsniveau van de ouders reduceren allen de kans dat kinderen niet deelnemen aan onderwijs. Vooral kinderen in huishoudens met een vrouw aan het hoofd hebben een specifiek grote kans om nooit naar school te gaan en uit te vallen.

Hoofdstuk 3: In welke mate en onder welke omstandigheden zijn ouders geneigd hun kinderen naar peuterscholen te sturen, welke bronnen in het gezin en hun gemeenschappen zijn daarbij van belang, en wat is de specifieke invloed van sociaal kapitaal?

Op basis van de zogenaamde 'social capital theory' verwachten we dat het sociale kapitaal van huishoudens en gemeenschappen niet alleen tot gevolg heeft dat ouders geneigd zullen zijn om hun kinderen naar de peuterschool te sturen, maar ook dat sociaal kapitaal het negatieve effect van een lage economische status van huishoudens op deelname in peuterscholen kan dempen. Beide verwachtingen worden getest met een enquête onder 43,879 Indonische kinderen die op hun beurt deel uitmaken van 42,855 huishoudens en 14,744 dorpen. Multilevel logistische regressie analyses bevestigen de aanwezigheid van een sterk negatief direct effect van een lage sociaal economische status van het huishouden op de kans dat een kind naar de peuterschool gaat. De resultaten laten tevens

zien dat wanneer de consumptie van moderne massa-media laag is, de deelname aan peuterscholen dan ook laag is. Sociaal kapitaal – gemeten als de deelname aan verenigingen en het door respondenten gerapporteerde niveau van wederkerigheid in de omgeving - hangt samen met een verhoogde kans dat kinderen naar de peuterschool gaan. Tevens zien we dat sociaal kapitaal in de vorm van wederkerigheid als een buffer werkt voor ouders met een relatief laag inkomen: het stelt hen in staat om hun kinderen toch naar de peuterschool te sturen. Onze bevindingen leggen een interessant samenspel van drie mechanisme bloot: (1) de aanwezigheid van wederkerige relaties kan ouders met een relatief laag inkomen in staat stellen hun kinderen naar de peuterschool te sturen, dit is een voorbeeld van wat wij een '*within-level cross-resource*' effect noemen (2) het wonen in een gemeenschap waar het vertrouwen in de medemens over het algemeen hoog is, versterkt het effect dat deelname aan verenigingen heeft op de deelname van kinderen in peuterscholen; dit noemen wij een '*between-level single-resource*' effect; en (3) het wonen in een stedelijk gebied versterkt het effect dat deelname aan verenigingen op peuterschooldeelname heeft, maar verzwakt het effect dat wederkerigheid op peuterschooldeelname heeft. Dit omdat er sprake is van een zogenaamd '*between-level cross-resource*' effect van stedelijkheid.

Hoofdstuk 4: In welke mate heeft de decentralisatie van het Indonesische onderwijs invloed gehad op (variaties in) hoe lang leerlingen onderwijs volgen, geanalyseerd op het niveau van provincies en gemeenten?

We bouwen voort op bestaand onderzoek door de invloed van gemeentelijke en andere verklarende variabelen te onderzoeken op hoe lang leerlingen onderwijs volgen in Indonesië. We verwachten dat, na de decentralisatie van het onderwijs in Indonesië: 1) leerlingen langer onderwijs volgen dan in de periode voor de decentralisatie; 2) regionale verschillen in hoe lang leerlingen onderwijs volgen toegenomen zullen zijn; en 3) dat hoe hoger de fiscale capaciteit, mate van stedelijkheid en ontwikkeling in een gemeente zijn, hoe hoger het gemeentelijk gemiddeld aantal jaren dat leerlingen onderwijs volgen zal zijn. Dit wordt ook verwacht voor nieuwe gemeenten die na de decentralisatie tot stand zijn gekomen. De hypothesen zijn getest met panel data van 5,541,983 respondenten die geaggrereerd zijn naar 3,880 observaties in 491 districten/steden in 32 provincies in zowel de pre- als post-decentralisatie periode. Multilevel analyses laten zien dat na de decentralisatie de tijd dat leerlingen onderwijs volgen enigszins toegenomen is maar dat de vooruitgang in deze toename enigszins is afgenomen. De variatie in de tijd dat leerlingen onderwijs volgen tussen provincies is wat afgenomen, terwijl de variatie tussen gemeenten is toegenomen. De mate van ontwikkeling en stedelijkheid van een gemeente hebben een positief effect op de tijd dat leerlingen onderwijs volgen, terwijl de fiscale capaciteit en de status als 'nieuwe gemeente' geen effect hebben.

Hoofdstuk 5: Hoe kunnen prestaties van leerlingen, alsmede prestatieverschillen tussen jongens en meisjes en rijke en arme kinderen, verklaard worden door verschillen in de ideologische en organisationele kenmerken van private Islamitische scholen in Indonesië?

We onderzoeken de effecten van verschillen in ideologische en organisationele kenmerken van private Islamitische scholen op de schoolprestaties van leerlingen en op het verschil in prestaties tussen jongens en meisjes, alsmede rijke en arme kinderen. Gebruikmakend van een 'onderwijs productie functie' benadering, beredeneren we hoe verschillen in ideologische en organisationele kenmerken van deze scholen leiden tot verschillen in beslissingen over investeringen en bronnenverdeling in middelbare scholen, en daarmee tot verschillen in schoolprestaties van leerlingen. De hypothesen zijn getest op data uit 2013 met informatie over 156,952 students in 3,150 scholen in 366 gemeenten. De resultaten maken duidelijk dat variaties in schoolprestaties en prestatieverschillen tussen groepen leerlingen gerelateerd zijn aan de ideologische en organisationele verschillen tussen de private Islamitische scholen. Alhoewel schoolprestaties en prestatieverschillen tussen groepen grotendeels bepaald worden door scholier-en familiekenmerken, laten de analyses zien dat ideologische en organisationele schoolverschillen ook invloed hebben. Daarnaast vonden we een interessant samenspel tussen de ideologische en organisationele verschillen en verschillende groepen. Ten eerste blijkt dat meisjes die naar scholen gaan die gestoeld zijn op een traditionalistische en modernistische islamitische ideologie minder presteren dan meisjes die naar scholen met een '*integrationist*' ideologie gaan; dit is een *between level and cross resource* effect. Ten tweede blijkt dat leerlingen in arme gemeenten minder goed presteren in scholen die als een *madrasah* georganiseerd zijn (en onder toezicht van het Ministerie van Religie staan) dan leerlingen in rijkere gemeenten die naar hetzelfde type school gaan. Dit is een *between-level single-resource effect*.
Kort gezegd levert het *multilevel, multi-resource* onderzoekskader dat centraal staat in dit proefschrift zinvolle inzichten op: het maakt duidelijk hoe specifieke combinaties van economisch, sociaal, menselijk, fysiek en politiek kapitaal met elkaar samenhangen en elkaar beïnvloeden op verschillende niveaus (het individuele, huishoudelijke, gemeenschaps- en overheidsniveau). Zo maakt dit kader inzichtelijk waarom de ongelijkheid in de toegankelijkheid en kwaliteit van het onderwijs in Indonesië zo hardnekkig is. Uit twee studies (hoofdstuk 3 en 5) blijkt echter hoe en onder welke omstandigheden een gebrek aan bepaalde bronnen gecompenseerd kan worden door toegang tot andersoortige bronnen op hetzelfde niveau, of door gelijksoortige bronnen op een ander niveau, via de zogenaamde *within-level cross-resource*, *between-level single-resource* en *between-levels and cross-resource* effecten.

Summary in English

Improving access to and quality of education is necessary condition to prepare a skilled workforce to advance a country from one economic level to the next level. However, increasing access to and quality of education alone is not sufficient without equitable learning for all. *Equal opportunity on* education affects an individual's life because it has the potential to improve the ability to think critically, to solve problems and to make appropriate decisions. Indonesian government simultaneously improves access to and quality of education for all citizens. Although its efforts had noticeable impact, many of the targets to improve access to and quality of education nevertheless still have not been achieved and education inequality is still persistent.

This dissertation studies the complex and multifaceted phenomenon of inequality in access to and quality of education. It uses analyses drawn from a multilevel multi-resource framework involving various nation-wide surveys, administrative datasets and experts' interview data from three non-governmental organizations in Indonesia to comprehend some of the mechanisms behind the unequal access to and quality of education. It suggests that the impact of and interplays between human, social, economic, political and infrastructural capital at the individual, household, school, community and government level are important on inequality in access to and quality of education in Indonesia.

Some of the questions discussed in the four empirical chapter of the dissertation include: Which characteristics at the level of municipalities, households and children help to explain why children never attend or drop out from school in Indonesia? To what extent and under which conditions can variations in preschool participation be explained by differences in household-level and community-level resources, and what is the moderating role of social capital? To what extent did the decentralization of Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels? How can variations in the (gender and parental socio-economic status related gaps of) academic achievement of students attending private Islamic schools be explained by ideological and organizational differences of their schools?

Which characteristics at the level of municipalities, households and children help to explain why children never attend or drop out from school in Indonesia?
We examine the relationship between municipality and household characteristics and the likelihood of children out of schooling. Building on opportunity structure approach, we theorize that a set of municipality and household characteristics could either hinder or facilitate children to be out of school. Hypotheses are tested using data from 221,392 children, nested in 136,182 households in 497 municipalities. Multilevel multinomial

analyses show municipality education expenditure can help prevent dropout but it could not attract children to attend school to begin with. In contrast, the availability of schools decreases the likelihood that children never attend school but it does not reduce dropout. High municipality poverty rates increase the likelihood of children never attending school, but they also lead to lower dropout rates. Family factors, such as wealth, education investment and educational background also reduce the likelihood that children are out of school. Belonging to a female-headed household increases the likelihood that children never attend or drop out from school.

To what extent and under which conditions can variations in preschool participation be explained by differences in household-level and community-level resources, and what is the moderating role of social capital?
Drawing on social capital theory, we theorize that high levels of household and community social capital not only lead to higher preschool enrollment rates, but also temper the negative effects of low socio-economic status on preschool attendance. Hypotheses on socio-economic status and social capital effects and their interaction were tested with Indonesian survey data, collected in 2009, on 43,879 children nested in 42,855 households in 14,774 villages. Multilevel logistic regression analyses confirm the strong negative main effects of low socio-economic status. In addition, low levels of access to modern mass media significantly decrease preschool attendance. Social capital represented by household association and community reciprocity increase preschool participation. Social capital based on perceived reciprocity compensates low-income parents that empower them to send their children to preschool. Our findings revealed three interplay mechanisms: (1) reciprocity can compensate low-income families for sending their children to preschool as a *within-level cross-resource effect*; (2) living in a higher trust strengthen the effect of association on preschool participation as a *between-level single-resource effect*; (3) residing in urban area reinforces the effect of associations but it weaken the effect of reciprocity on preschool participation as a *between level cross resource effect* consists in urbanization.

To what extent did the decentralization of Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels?
We advance existing research by examining the influence of both municipal factors and other explanatory variables on educational attainment in Indonesia. In particular, we hypothesize that after decentralization, 1) educational attainment is higher compared to the pre-decentralization era, 2) regional variations in educational attainment will have increased, and 3) the fiscal capacity, degree of urbanization, and development will be higher; the higher the municipality's mean year of schooling. The latter is also expected for the newly created municipalities of the past years. Hypotheses are tested using panel data on 5,541,983 respondents aggregated to 3,880 observations in 491 districts/cities in 32 provinces for the pre and post-decentralization periods. Multilevel analyses reveal that

after decentralization, the length of schooling slightly increased but progress in the length of schooling slightly decreased. In addition, educational attainment variation between provinces slightly decreased but the variation among municipalities increased. Moreover, the degree of municipalities' development and urbanization have a significantly positive impact on improving educational attainment while the fiscal capacity and the status of being a new municipality do not have a significant effect on extending the length of schooling.

How can variations in the (gender and parental socio-economic status related gaps of) academic achievement of students attending private Islamic schools be explained by ideological and organizational differences of their schools?

We investigate the effects of different organizational governance (tracks) and ideological organization (streams) of private Islamic schools on student achievement and achievement gaps. Drawing on an education production function approach, we outline differences in investment and resource allocation decisions across these tracks and streams. Hypotheses are tested using Indonesian data collected in 2013 on 156,952 students in 3,150 schools in 366 municipalities. Evidence showed that student achievement and achievement gaps vary over private Islamic school tracks and streams. Even though student achievement and achievement gaps are strongly determined by student and family characteristics, the results show that differences between school tracks and streams also play an important role. Moreover, this study found two interplay mechanisms: (1) attending in Traditionalist and Modernist streams significantly decrease the achievement of female students as an example of *between-level and cross-resource effects;* (2) being located in a municipality with a high poverty rate decreases the positive effect of madrasah on student achievement as a *between-level single-resource effects.*

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